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GEOGRAPHY

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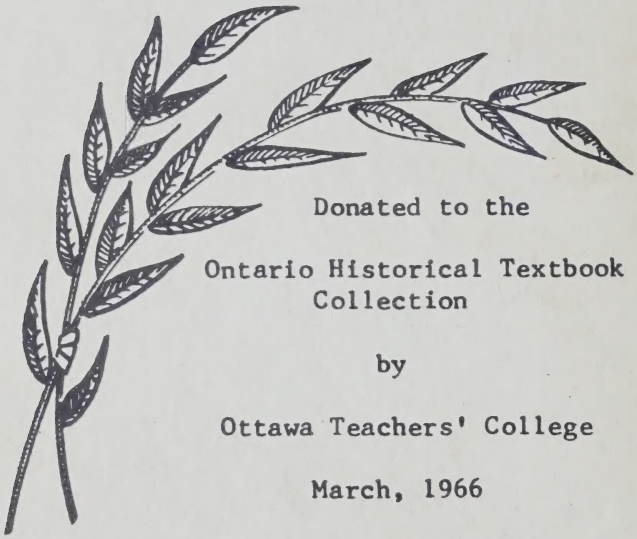

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ONTARIO
TEACHERS' MANUALS

GEOGRAPHY

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CORRIGENDA

A new Manual on Geography will be prepared in the early future. In the meantime, attention is called to some details of the present book.

The Geography Reader called *The Story of the Earth and Its Peoples,* is no longer procurable; and all references to that book should now be eliminated from these pages. The first part of the new *Ontario Public School Geography* now takes the place of the Geography Reader.

All references to the *Ontario School Geography* should now be adjusted to suit the new *Ontario Public School Geography*:

Page 87—Eight lines from bottom—Read, pages 64-70.
Page 99—Eight lines from bottom—Read, page 56.
Page 117—Three lines from bottom—Read, pages 249-252.
Page 145—Line seven—Read, pages 36-38.
Page 179—Line fourteen—Read, pages 249-252.
Page 179—Line sixteen—Read, page 250.

The references to the old text-book on the following pages should now be omitted:

Pages 92, 98, 99, 100, 101, 106, 108, 109, 110, 128, 147, 149, 150, 152, 162, 164, 171, 172, 173, 174, 181, 185.

A few of the Books of Reference, pages 193-195, are now out of print. Consult the publishers.

GEOGRAPHY

PUBLIC AND SEPARATE SCHOOL COURSE OF STUDY

FORM I, SENIOR GRADE

(Consult Chapters IV and V.)

1. Observations of the local surroundings.
2. General notions of direction and time.
3. Simple observations of the weather and seasons, of the sun and moon.
4. Observations of the land and water forms in the neighbourhood.
5. Simple observations of the activities of the home and the neighbourhood.

FORM II

(Consult Chapters VI and VII.)

1. Land and water forms continued. Representation of the forms of land and water by modelling and drawing.
2. Observations of the common phenomena of the weather, and the changes and characteristic features of each season.

3. Outline study, on a globe and on the map of the world, of the earth as a whole, its continents and oceans, and the relative position of each.
4. Local geography.
5. Map drawing.
6. Local marketing, local industries, raw material, products, and distribution.
7. Places of geographical interest in the neighbourhood.
8. Places of historical interest in the neighbourhood.
9. The people of the locality and their nationalities.
10. Child life in other lands.

FORM III, JUNIOR GRADE

(Consult Chapters VIII and IX.)

1. The earth as a whole: its form, rotation, axis, poles, equator; its hot, temperate, and cold regions.
2. The position on a map of the world of the continents with their chief countries and islands, and of the oceans with their chief seas, gulfs, and bays.
3. The physical, political, and commercial geography of North America.
4. The Dominion of Canada as a whole and its Provinces.
5. Ontario in particular with its local commerce: the leading articles of exchange, the chief collecting and distributing centres, the means of transport, and the commercial routes.
6. The study of selected portions of the Geography Reader; supplementary reading.

FORM III, SENIOR GRADE

(Consult Chapters X and XI.)

1. Elementary notions of the sun, moon, stars, and earth in space.
2. An outline of physical, political, and commercial geography of the Dominion of Canada and of each of its Provinces, with the most important local commerce of each, the articles of exchange, the chief collecting and distributing centres; means of transportation, the commercial routes.
3. The Mother-country in general.
4. The British Empire and its chief component parts.
5. The further study of the Geography Reader; supplementary reading.

FORM IV, JUNIOR GRADE

(Consult Chapters XII and XIII.)

1. The earth as a planet: its form, size, motions, and seasons.
2. Latitude and longitude.
3. The important physical features of the earth: continent structure and outline—the great mountain chains, highlands and slopes; the great river basins and river systems; the coast-lines.
4. A brief study of Europe, and North and South America, with reference to their principal physical and political divisions; their natural resources, industries and products; their leading routes of travel and commerce; their great centres of population.

FORM IV, SENIOR GRADE

(Consult Chapters XIV and XV.)

1. Winds: elementary ideas of the nature and the influence of the prevailing winds, land and sea breezes, trade-winds, polar winds, and monsoons.
2. Causes of ocean currents; the direction and the influence of the Gulf Stream, the Japan Current, and the Polar Currents; causes of movements of tides.
3. Eclipses of the sun and moon.
4. Climate: the principal influences which determine or which modify the climate of a place, and which affect the products.
5. The light and heat zones, and the distribution of plants and animals.
6. The study of North and South America continued, with a brief study of Europe, Asia, Africa, Australia, and New Zealand with reference to the principal physical and political divisions, climate, natural resources, industries, and products, routes of travel and commerce, and the chief centres of population. A more detailed study of Canada; the United States.
7. A more detailed study of the component parts of the British Empire, especially in their relation to Canada.

GEOGRAPHY

CHAPTER I

THE TEACHING OF GEOGRAPHY

THE POINT OF VIEW

THE TEACHER must have correct ideas of the nature and scope of geography before he can understand and apply rational methods of teaching it. The old definition, "Geography is a description of the earth", led teachers to regard the subject as a mere collection of facts, largely unconnected, to be memorized. From this point of view, the chief work in geography was the learning of definitions, boundaries of countries, names and locations of cities, rivers, capes, etc., with little attention to relationship.

Nothing could be more deadening to an active, inquiring mind than this method of teaching this subject. Fortunately in recent years a marked change has taken place in the point of view from which the subject is approached; but if teachers are to be judged by their actions rather than by their speech, geography is still, in the case of many teachers, a collection of facts to be memorized; the only difference lies in the endeavour to make the subject more attractive by adding some interesting information. When, however, the subject is given unity by some central idea, then geography ceases to need adventitious aids to make it interesting.

HOME GEOGRAPHY

This central idea is supplied when we approach geography from the point of view of man's relation to his environment. Every mind, even that of the youngest pupil at school, is interested in the uses of things, or, in other words, their relations to one another and to man. In order, however, that these relations may be understood and that they may have a meaning when applied to distant peoples, it is necessary that they should be learned by actual observation rather than from books, especially in the early stages of the subject. From this point of view, the study of the locality in which the pupil lives becomes the starting-point in the study of geography. If the pupil has gone about his own home region with his eyes closed, the words of the text-book in geography can have no real meaning for him; and even if he is able to repeat the definitions or explanations of the book, it is not evidence that he really understands what he is saying.

THE TWOFOLD ASPECT OF GEOGRAPHY

The study of geography has two faces, one looking toward nature, the other toward man. It is thus related on one side to nature study and elementary science, and on the other to history. At first it is a study of nature and man, not books. Land and water, vegetation and climate, products and transportation within the home district, furnish the subject-matter. The pupil observes the hills and valleys with their slopes, the streams and their direction. He examines the soils on the hilltops and in the valleys and notes differences. He observes the rains washing the soil down the slopes and the streams carrying part of it away. This is nature at work.

He observes woodland and pasture land, sees what crops are grown on the highlands and in the rich valleys, sees how the crops when reaped are carried away by road, railway, or water-way, and notes the interchange of goods between the farm and the town. He visits local industries, sees raw materials and the manufactured products, and learns about their transportation. He sees numbers of men combining for industrial ends and begins to realize the dependence of each upon his fellows. This is man at work.

From the early studies in geography to the latest these twofold aspects of the subject must be kept in view. For example, the influence of heat on man's life may be shown by a comparison of the peoples whose native home is on the borders of the Arctic Ocean, in Ontario, or in the West Indies. The influence of heat and moisture on vegetation may be illustrated by a comparison of the arid lands of the Sahara and the forest-laden plains of Brazil; their influence on man's occupations will follow naturally. The early British settlements in America lay along the Atlantic coast-line and were walled in by the Alleghany Mountains; the French settlements lay along the St. Lawrence River—the open highway to the heart of the continent.

When a pupil realizes that a country like Great Britain has vast beds of coal and iron, he will soon connect, in thought, the presence of these two and the manufacture there of nails, knives, agricultural implements, steel rails, etc.; he will see why Glasgow, Manchester, Sheffield, and Birmingham are popular centres. Another step, and he will see why the principal imports are wheat, flour, meat, and other food supplies. A step further, and he will see why there are great ports at Glasgow, Liverpool, Bristol, Hull, and London. The physical and the human aspects go hand in hand.

THE PRACTICAL VALUE OF GEOGRAPHY

Properly taught, geography trains the pupil's powers of observation, commands his interests, develops his imagination, and exercises his judgment. But while this subject trains the mind in the ways indicated, it is also of great practical utility in the affairs of life.

Without a fair knowledge of geography the current events of the day cannot be understood; many events of history will be unintelligible; and the student of literature will often be as much astray as the school-girl who, while reading *The Merchant of Venice,* placed Venice in the south of Russia. Even to know where places are and what the peoples of these places do, adds much to one's intelligence; but when the relation between climate and surface conditions and the people has been studied, and the pupil becomes conscious of a growing power which carries him on to higher stages of development, he feels that there are few problems of economics and history which his knowledge of geography does not help him to understand.

The pupils of to-day will be the farmers, the manufacturers, and the merchants of to-morrow; and it is impossible for one to cope successfully with the complicated problems of supply and demand, of trade and commerce, without such a general knowledge of the part of the world to which his business is directed as will enable him profitably to make an intensive study of that region.

As all the natural sciences are founded upon observation of the ordinary phenomena, a careful study of home geography opens the door of these studies; thus geography may be regarded as the key to all the elementary sciences.

CHAPTER II

PRINCIPLES INVOLVED IN TEACHING GEOGRAPHY

HOME GEOGRAPHY FIRST

One of the first principles in the teaching of geography, as also in the teaching of all other subjects, is that it should be based upon the knowledge and experience which have already been acquired by the learner. It cannot be based upon mere words or definitions; these are, or should be, the generalizations resulting from many acts of observation, and not mere meaningless formulas to be repeated parrot-like by the pupil. As we have already pointed out, it is from the home or out-of-door geography that this necessary experience is acquired by the learner; for it is only by a careful study of the near that the remote and unseen can be understood.

It is difficult, if not impossible, to teach pupils with a meagre experience why there is a great city at the head of ocean navigation on the St. Lawrence River, or how Niagara Falls has affected shipping on Lakes Erie and Ontario as well as the position and growth of cities on these lakes. But with an adequate store of ideas derived from a careful and systematic study of home geography, the pupil has a solid foundation on which the teacher may build.

In addition to supplying true and vivid basal ideas, the study of home geography arouses a spirit of inquiry concerning the subject, which should lead to further investigation and study. This is the real goal of all teaching; for the important matter is not that the pupil knows certain things, but that he sees the meaning of what he

has learned, and that he has acquired such a liking for the subject as will induce him to continue its study.

A STUDY OF RELATIONS

As we have already pointed out, the study of geography should consist not in the mere memorization of facts, but in the study of relations. At every step the pupil should be brought face to face with the notion of cause and effect. The mind delights in tracing the causes of things, and so long as the work on hand is of such a nature as to exercise the judgment, the pupil is interested. The boy or girl takes a pleasure in tracing the origin of cities and towns and in accounting for their situation; in showing why certain parts of the earth are desert regions, as along the west coast of South America; in explaining why the southern parts of South America and the northern parts of Europe in the same latitude, south and north, have similar rainfalls, etc. When we seek to determine the origin of the cotton industry of the west of England, the shipbuilding on the Clyde, the fishing industry of Newfoundland, the production of wheat in the Prairie Provinces or Argentina, the great coal and steel industries of Sydney, Cape Breton, we find our classes at once brightening up and doing their best to discover adequate reasons.

THE INDUCTIVE METHOD

In teaching geography the inductive method is followed. That is to say, the pupils are required to observe particular examples and to compare these, in order that they may discover the general principle that is common to them all.

Observations upon natural phenomena should be made and recorded in all grades. These should vary from

simple records of sunshine, cloud, rain, snow, and wind, to more difficult observations where the thermometer, barometer, and rain-gauge are used. A pupil who has followed the daily marking of the shadow line throughout the school year, will reach correct inferences which even some of the older pupils, who have learned their work from books alone, cannot make. Continued observation of land and water forms and comparison of related forms with one another are the only means of reaching correct generalizations. For example, how can a pupil get a correct notion of a valley who knows a valley from observation of only one valley, such as that of the Don, the Grand, the Thames, or the Trent? How can such a pupil ever have a correct idea of the valley of the St. Lawrence or the Mississippi? There must be, therefore, many observations of different valleys and comparisons of these, to eliminate the incidental and retain only the common features in the generalization.

CORRELATION WITH OTHER STUDIES

It need scarcely be pointed out that the study of geography should, wherever possible, be correlated with the other studies of the school course. For example, history is unintelligible without geography. In the beginning, home geography and nature study are almost synonymous terms. Language lessons are frequently based upon the discoveries made in the pursuit of home geography and, when the pupil is further advanced, the geography lessons supply excellent topics for descriptive composition. In the representation of land and water forms, the pupil is given practice in clay modelling and art; and, finally, almost every department of natural science is required in explaining the phenomena which form the basal work in geography.

CHAPTER III

GEOGRAPHIC AIDS

HOME geography is a matter of direct observation, but when a distant region is to be studied, realistic word pictures, globes, maps, models, pictures, sample products, and descriptive reading must be used to enable the pupil to form a clear conception of its geographic features.

GLOBES

Beginning with Form II, globes should be used to give a view of the earth as a whole—its form, its divisions into land and water, the relative positions of the continents and the oceans; its hot, temperate, and cold regions, etc.

If each pupil in Forms III and IV has a small globe, four inches in diameter, the positions of equator, tropics, polar circles, meridians, etc., may be readily indicated by means of lines drawn upon its surface or rubber bands held in place by small tacks.

A globe sixteen inches in diameter is one of convenient size for the class-room, as four inches in length on it represents a thousand miles on the earth's surface. In addition to the ordinary globe, every school should have another covered with a slate surface.

MAPS

A map is a shorthand representation of a number of geographical facts. The pupil must be taught to interpret its symbols, that is, he must be taught to read a map and to get thoughts from it as from a book. To a certain extent, the study of the map is a substitute for personal

observation. It is a window through which the pupil looks out upon the country he is studying.

When the pupil has learned to read maps, he must be led to apply the information obtained to practical problems, such, for example, as the kinds of products in different regions, the probable exchange of these products, and the routes and means by which such exchanges are accomplished.

The teacher should, both by example and precept, encourage the habit of locating on maps all places mentioned in history, literature, and general reading; and when books of travel are being read, the map should be freely used in tracing the progress of the traveller.

Freehand map-sketching is a device for training pupils to read maps; to locate mountain ranges, important rivers, and large cities; to indicate, by shading, regions of ample rainfall and the prevailing industries of certain districts, such as agriculture, lumbering, and mining; to show trade routes, etc.

Because of their influence upon climate, etc., pupils should know the general shapes of the continents, the general direction of the coast-lines, the great peninsulas and arms of the sea. Only a general accuracy of outline is required; much time should not be devoted to securing great accuracy of detail in map-sketching. This may be secured by means of outline maps, which enable the pupil to concentrate his attention upon a particular point without wasting time upon unnecessary details.

For class teaching, an outline map on the black-board, on which the features are marked as they are taught from day to day, is a most effective method of teaching map geography, as attention is centred upon one thing at a time. The outline on the black-board should be fairly

accurate and should not have names marked on it; otherwise its use in review will be very slight. Such maps may be used with great advantage in the history lesson.

One or more maps should be hanging on the walls of the school-room all the day. They should not be rolled up and kept in a corner of the room. Many an important geographical fact may be learned incidentally by the pupils from maps that are constantly before their eyes.

BLACK-BOARDS

In teaching geography, much use should be made of the black-board. Outlines of continents and countries, cross sections of these illustrating their physical features, and diagrams marking places, when drawn on the black-board as the lesson is proceeding, help the pupil to understand it much more clearly. In describing the position of Montreal, for example, how much clearer it becomes when a sketch of the island is made and the city outlined in its proper position. Since nothing appears on the black-board outline but that which is being taught, the mind of the pupil is not confused by the many details of the ordinary map. The subject thus develops more clearly in the mind of the learner as it is being taught by the teacher. The use of coloured crayons, to distinguish one part from another, answers the purpose of the tints and shades employed in the ordinary school maps.

Every school should, if possible, have a set of slated maps. Such maps can be used like the black-board and have the advantage of being more accurate in outline than those drawn by the teacher on the black-board.

As the lesson proceeds, it should be summarized on the black-board. This summary emphasizes the main features of the lesson, prevents the teacher from becoming discursive, and is conducive to systematic work.

NEWSPAPERS

The systematic use of newspapers and magazines in school is of great help in teaching geography. The study of current events enables pupils to extend their knowledge of geography by reading, as distinguished from actual study. They learn geographical ideas by simply reading with an attention born of interest. Reading thus becomes an habitual review and is constantly sending the investigator to the text-book for more information. Items and advertisements relating to the establishment of new industries, to the construction of railways or canals, and to changes affecting transportation and navigation, furnish much information and also lead to a forecasting of the probable changes resulting from the new conditions. The pupil soon sees that almost every day brings about some geographical change—daily some new industry is begun, some new town is founded, or some product is discovered in a new region. His horizon widens. He feels a new stimulus. No better preparation for acquiring knowledge of a business life can be made than the cultivation of the ability to recognize the ever-changing conditions of business dependent upon ever-changing geographical conditions.

There are several ways in which newspapers may be used in school. The teacher may mark selections with a coloured pencil in a paper accessible to the pupils, or he may clip these and put them up on the bulletin board, afterward putting away the more important of them in a large manilla envelope or in a scrap-book. He should bear in mind that the mere preservation of these selections is in itself not of so much value as the discussions as to which are of sufficient importance to preserve. Pupils are to be encouraged to clip for themselves and for the class. They should, however, be cautioned against accepting

every geographical item they may see in print as absolutely reliable. The discussion on these items should, of course, take place when the news is quite fresh.

SUPPLEMENTARY READING

No text-book on geography can be sufficiently full to present all that a pupil may desire to know regarding a region that is being studied. Sets of Geography Readers suitable for all the grades, books of travel, and accounts of voyages of discovery should be placed in the school library, and the pupils should be encouraged to use them. Magazines frequently contain well-written articles on geographical topics which the teacher may read to his class; and when the teacher in his general reading meets with fine descriptive passages, he should make a note of them and use them in their proper geographical connection. Government Reports are sometimes of great value in calling attention to geographical changes. As these are compiled with care, their statements may be depended upon to be accurate. They may be obtained by application to the Deputy Minister of the Department whose Report is desired.

The following method of using supplementary reading is suggested: After the teacher has given an outline of the geography of a country, the pupils become responsible for the interesting details. This means reading and research on their part. They should be required to report, orally or in writing, the results of their researches. Each pupil may be held responsible for some phase of the subject in hand. Experience shows that, in general, pupils are pleased at reporting the new information to the class. Facts gleaned from such researches are usually retained.

PICTURES

A picture of a building, a derrick, a landscape, a lock of a canal, or a volcano in eruption, teaches oftentimes more clearly than the printed page; it tells a plain story which appeals to the mind, excites interest, and leaves a distinct and vivid mental image.

Let us, for example, look at the picture in the first column of page 122 of the *Ontario School Geography*. We can easily read the title of the picture, but what information can we obtain from looking at the objects shown in it? Name the objects in the foreground of the picture. What name would you give to the sheet of water in the distance? Were these rocks always this shape? Are they changing from day to day? What is the principal agent in erosion? Find Hopewell Cape on the map on page 125. Why are the rocks worn away more rapidly near the base? Give reasons why no trees grow upon the smaller rock. Why do not the trees extend further down on the large rock? What has become of the rock which at one time joined these rocks to the mainland? Why have these rocks withstood the action of waves and tides longer than some other rocks? Does the size of the trees give you any information regarding the time the erosion has been acting about the base of this rock? What has become of the material that has been worn away? How high are these rocks? Why is the man shown in the picture? If the man were five feet ten inches in height, calculate the height of each rock. What will probably be the fate of these rocks? What will be the first great movement in the large rock? Will the wearing away of the mass be faster or slower then? Why? Find other pictures in this book that show the wearing away of a coast. Find pictures that show the building up of a coastal plain.

Many of the pictures in this book are worthy of careful study, and the teacher should direct the pupil's attention to each picture by questions similar to the above.

After a few pictures have been studied by the pupils and teacher together, the pupils should be asked to describe one or more of these in writing. This, as well as what follows, provides excellent seat work in written composition.

Examine the pictures in the geography referring to transportation and notice the various methods shown. State the country in which each method is in use. Look at the pictures that show bridges. In what country is each bridge found? What is the nature of the traffic? How can you tell? Compare pictures that show the dress of the people of the various countries. Try to account for the material used and the style of the garments. Study pictures that show typical rural industries in Ontario. Name the industries shown in each picture. Describe the various industries. What industries carried on in other parts of Canada are pictured?

There is hardly a limit to the vast amount of information that may be gained from a study of the pictures shown in the text-book. The pupils of Form IV may, for example, make a study of the pictures that show various historic styles of architecture. They will then be in a better position to appreciate the architecture of places, government buildings, churches, etc.

In addition to the study of the pictures in the text-book, teachers should make a collection of cuts and photographs for use in school. These should be mounted on cardboard and indexed, so that they may be easily found when needed.

When there is a school lantern, full use should be made of it. In this way the teacher is furnished with an oppor-

tunity to draw out his pupils and to supplement the text-book with such information as is relevant to the subject and adapted to the class.

STEREOSCOPIC VIEWS

The stereoscopic view has an advantage over the ordinary picture in that it represents objects as having three dimensions, instead of showing merely a flat surface, as in a picture or diagram. As a result, objects are made to appear before the eye as they are, with all their wealth of detail, and the observer is given the impression that he is looking at a real scene. The advantages of the use of the stereoscope in the school-room are evident. The pictures are inexpensive and are easily obtained.

SCHOOL EXCURSIONS

In addition to the field study of home geography, there should be school excursions to places of interest beyond the immediate neighbourhood of the school, such as quarries, mills, dairy farms, mines, factories, and lumber camps. These put fresh life and new meaning into the subjects treated of in the text-book. Like all out-of-door geography, they give to the pupil the necessary first-hand knowledge which results from the learner's being brought face to face with the thing to be studied.

Open-air instruction is, however, attended with many difficulties, arising partly from the fact that children, when out-of-doors, are accustomed to entire freedom and not to orderly study, and partly from the large number in the class, which compels the teacher to give his attention to only a few individuals at a time.

GRAPHIC ILLUSTRATIONS

The population and area of countries or cities, the amount of commerce carried on, the value of the productions of a country, are not to be committed to memory; but at times it is of great service to know the proportion one thing bears to another. This can be shown to best advantage by graphic illustrations, using lines, squares, or circles. Thus if a line a foot long is taken to represent the average height of the interior plateau of British Columbia, it will require one three and a half feet long to represent the average height of Bolivia, one four feet long to represent the elevation of Tibet, and one seven inches long to represent the average height of Switzerland. By means of a graphic illustration, it is easy to show that South America is just a little less than twice as large as Canada, and that Africa is a little more than three times as large.

MAP MODELLING

"The most frequent form of map work employed in the lower grades is some form of map modelling, either in sand, clay, or paper pulp. A few years ago such work was more common than it is now, and the sand-table was an essential part of the equipment of any well-ordered school-room. Map modelling is capable of producing excellent results in the hands of a qualified teacher, but in the hands of one less experienced is likely to be very bad, both in character and in the results that pupils secure. In order to be effective, one very constant and serious danger must be guarded against—and that is the danger that pupils will visualize the models of large areas, of which the vertical scale must be seriously exaggerated, and that they will think that the region depicted actually looks like their model.

Practically no models can be made without vertical exaggeration of scale, which means over-steepened slopes, over-rugged profiles, and impossible landscapes. Even the skilfully made relief models and maps furnished by publishers have to be used with great caution in this regard. How much more carefully must the models made by inexpert pupils be used, to prevent erroneous ideas that only long and hard study will correct as the years go on. Better a blank mind than one full of wrong impressions, is the verdict of any teacher in the upper grades. Unlearning is harder for both pupil and teacher than learning. . . .

"The best way to introduce this work is to model the area to be seen in the local landscape. By comparing the slopes of the model with the slopes in nature, pupils may be led to see how far from the truth their product is, and therefore how much more erroneous must be the model of any larger areas.

"The first modelling should be to show general relations and not to attempt to show a given region. Let children represent flat land, gentle slopes, strong slopes, and very rugged regions, and judge their products with care. Then let them model the region within their visible landscape and compare the slopes of this model with the slopes they have previously made. Let them see whether they have shown what they know to be gentle slopes as gentle slopes, or, as will more probably be the result, in a very much exaggerated way. Thus, by successive steps, one can lead up to the models of larger areas which show general relations only and do not pretend to show exact conditions. A model, or a relief map, of North America, for instance, that shows general relations, may be made the basis or even the climax of

some effective work, but similar products which seem to indicate that the section considered is really pictured are dangerous monstrosities that should be avoided with diligence and forethought.

"Map modelling has its place as an effective means of teaching, but its place is more secure with older than with younger pupils. This form of expression must always be used with caution and should not be employed by the follower of a book or a method who himself has no natural ability for doing this work."

Dodge and Kirchwey: *The Teaching of Geography in Elementary Schools.* Rand, McNally & Company.

THE SAND-TABLE

The sand-table is merely a shallow tray, or box, of any convenient dimensions set on a table. The desired geographical form is moulded in sand. The sand-table is of use in furnishing the pupils with a means of expressing their ideas of the ordinary *physical features of the neighbourhood.* Instead of having the pupils tell about these or write about them, they may be modelled in sand. It may also be used sparingly to illustrate those geographical features of which there are no examples in the vicinity. These cannot be studied as home geography, but models of them may be made in the sand-table.

OTHER AIDS

Collections of minerals, of productions of foreign lands, and of the implements and dress of different peoples, are of great interest to pupils and are of value in giving concrete expression to what otherwise could be expressed only in words. Pupils should be encouraged to visit museums, and geographical, botanical, and zoological gardens whenever possible.

CHAPTER IV

FORM I, SENIOR GRADE

DETAILS OF THE COURSE

PLAN to cover the Course in one year, the time usually required to complete the work of the Senior Grade of Form I. This can be readily done, provided (*a*) that general notions only are taught, and (*b*) that lesson topics are chosen exclusively from what can be observed in the home locality.

It is not required that the work should be taught in the order as outlined below. Lessons should be given when the time is most opportune. For example, a lesson on "Rain" may be taken on a rainy day; on "Autumn", in the fall of the year; on the "Full Moon", when the moon is full, etc.

Keep a record of all lessons taught.

1. OBSERVATIONS OF LOCAL SURROUNDINGS

Under this heading may be taken, as topics of class instruction, only those more or less permanent objects or landmarks that are likely to attract attention. As these lessons must be based upon actual observations made by the pupils themselves, only such topics should be selected as are connected with objects found in the locality. For example, if a mine, or a lighthouse, or a toll-gate, or a jail is in the neighbourhood, it becomes a legitimate object of class study. If, however such things are not found, obviously they can not be used for observation purposes, and hence must not, at this stage, be used as lesson topics.

In other words, what may be an appropriate lesson topic in one place may be quite inappropriate in another.

LESSON TOPICS SUGGESTED

Such topics as the following may be used for lesson purposes:

Country, city, town, village, farm, lot, line fence, road, concession road, side road, town line, base-line, toll-gate, street, side-walk, lane, bridge, culvert, field, meadow, pasture, bush, park, clearing, orchard, garden, rocks, boulders, church, school, town-hall or township hall, fair grounds, house of refuge, public library, jail, court-house, cemetery, fort, monument, tower, wharf, break-water, pier, dam, lighthouse.

For hints on teaching the following topics, see "Suggestions for Lessons", Chapter V: Country, town, village, roads, the school, house of refuge.

2. (*a*) GENERAL NOTIONS OF DIRECTION

The pupils are already more or less familiar with the general terms denoting direction. Hence, all that is required is to give them an opportunity in class to use such terms definitely and consciously. In this way their meaning and application are likely to be so impressed upon the pupils that they should be able to use them intelligently and freely in ordinary conversation.

LESSON TOPICS SUGGESTED

Up, down; above, below; upward, downward; skyward, earthward; forward, backward, sideways; front, side, back; beside, behind, over, under, beyond, between; outward, inward; right, left; east, west, north, south; north-west, north-east, south-east, south-west; windward, leeward.

For hints on teaching the following topics, see "Suggestions for Lessons", Chapter V: Up, down; front, side, back, etc.; right, left; east, west, north, south; windward, leeward.

2. (*b*) GENERAL NOTIONS OF TIME

LESSON TOPICS SUGGESTED

Day, night, morning, evening; sunrise, sunset; daybreak, twilight; noon, forenoon (a.m.), afternoon (p.m.); hour, minute, day (24 hours); week, days of week, midweek, week end; fortnight; to-day, to-morrow, yesterday; month, names of months, number of days in each—

Thirty days has September,
April, June, and November.
February has twenty-eight alone,
And all the rest have thirty-one,
But leap year coming once in four
February then has one day more.

For hints on teaching the following topics, see "Suggestions for Lessons", Chapter V: Day, night, minute, hour.

3. SIMPLE OBSERVATIONS OF WEATHER, SEASONS, ETC.

(*a*) Weather:

Advantage should be taken of wet and dry days, of warm and cold days, of rain storms, etc., for conversational lessons. Only common phenomena with their general effects should be discussed here. The pupils of this Grade have not the maturity of mind required to understand the physical causes of such phenomena. Keep a simple daily weather record on the black-board or on a large card and, with the pupils' help, fill in daily.

LESSON TOPICS SUGGESTED

Wet, dry, warm, hot, sunny, cloudy, cold, frosty, wintry, calm, windy, stormy, misty, foggy, etc.

Winds, clouds, fog, rain, thunder and lightning, rainbow, white frost, ice, snow, hail, sleet, drought.

For hints on teaching the following topics, see "Suggestions for Lessons", Chapter V: Wet, dry, cold, etc.; winds; clouds, fogs; rain; thunder and lightning; dew; ice.

(*b*) The sun:

Observations of the sun as the source of light and heat, its progress from sunrise to sunset, its absence during the night, its shifting shadows, relative lengths of day and night.

(*c*) The moon:

Observations of its changing position and appearance, its source of light. The "Big Dipper" and the North Star.

For hints on the teaching of these topics, see "Suggestions for Lessons", Chapter V: *The Sun, The Moon.*

(*d*) The seasons:

Names of the four seasons; the months comprised in each; a few of the chief characteristics of each season giving special attention to the varying length of day and night, to the character of weather, and to the chief outdoor activities of play and work.

These general observations may be followed by separate lessons on each of the seasons, taken only in season.

For hints on teaching the following topic, see "Suggestions for Lessons", Chapter V: Autumn.

4. THE LAND AND WATER FORMS IN THE NEIGHBOURHOOD

(1) According to the Course of Study for this Grade, simple observations of the land and water forms *in the neighbourhood* are to be taught. In planning a series of lessons covering this prescribed outline of work, the teacher is recommended, at the beginning of the term, to make a list of the land and water forms that are actually found in the neighbourhood and to confine the lesson topics to the list thus made.

Many localities in eastern and northern Ontario are supplied with land and water forms in almost endless variety. In such places the teaching of these forms will present little difficulty, as the observational method may be freely used. In many other parts of the Province, however, the teacher must be content with a much smaller variety. Informally, and to supplement the above Course, the wide-awake teacher may, however, find opportunities to give his pupils an elementary notion of many of these land and water forms, even when they are not actually found in the locality.

In the spring time and after a heavy rainfall, the school yard, the roadsides, and neighbouring fields are covered with innumerable miniature lakes, islands, capes, straits, etc., which will serve to illustrate most of the land and water forms of the wide world. Why should use not be made of these very concrete objects to inculcate correct geographical notions? All that is required is to teach that this is an *island* because it is surrounded by water; that that is a *strait* because it joins two larger bodies of water; etc., etc. Then set the pupil to discover for himself as many islands, straits, etc., as possible. This prac-

tical work will prove a source of great delight to him, and the knowledge thus gained will be accurate and lasting.

(2) No skilled teacher in this grade of work wastes his own time and that of his pupils by merely talking about things and requiring that the exact words of a book definition should be memorized. In acquiring his general knowledge of the land and water forms in the neighbourhood, why should the child not be allowed to get it in the way in which he got his knowledge of a hat, or of a dog, or of a table, etc.? He learned to know these things by *sensing* them, by coming into contact with them. Why should he not get his knowledge of a hill, or of a plain, or of a brook, in the same way?

Take a brook for illustration. By one method the pupil may, by hearing the teacher talk, talk, talk, learn the stereotyped definition, "A brook is a small stream of fresh water flowing over the land". By the other method he will study the brook itself and may discover for himself the following: A brook is running water. The water is fresh. The brook runs downward. The brook winds about. Where the brook is swift, the slope of the land is steep. In some parts the bottom of the brook is rocky, or gravelly, or muddy. The water flows slowly over the muddy bottom. The brook grows larger as it flows downward. The land slopes to the brook on both sides, etc., etc.

Which pupil knows more about the brook, the one who learned the definition by hearing the teacher *talk* about it, or the one who learned the facts by *seeing* and discovering for himself? Which pupil has gained the greater power in the study? Which has the knowledge best suited to his later life? The pupil has a right to learn to describe objects *in his own words,* in order that he may gain in his power to see and to express. What

right has the teacher to deprive him of growth merely that, for promotion examination or for other purposes, he may appear to know what he really does not know?

LESSON TOPICS SUGGESTED

Hill, valley, ravine, plain, island, stream, rapids, waterfall, pond, lake, canal, harbour, drain, ditch, swamp, etc., as found in the neighbourhood.

For hints on teaching the following topics, see "Suggestions for Lessons", Chapter V: Hills; a ditch.

5. SIMPLE OBSERVATIONS OF LOCAL ACTIVITIES

RELATING TO THE HOME

Foods and their preparation, such as flour, meal, butter, cheese, meats.

Clothing material, such as wool, cotton, linen, silk, leather; their source, but not their manufacture unless carried on locally.

RELATING TO THE FARM

Activities, such as seeding, harvesting, thrashing, marketing, fruit-growing, poultry-keeping, clearing land, lumbering, drainage, etc., as carried on by local farmers.

OTHER ACTIVITIES

The store, post-office, shop, factory, mill, railway, gravel-pit, brick-yard, quarry, mine, fishery, etc.

For hints on teaching the following topics, see "Suggestions for Lessons", Chapter V: Bread; the farm; the store; the cheese factory; the railway.

CHAPTER V

FORM I, SENIOR GRADE

SUGGESTIONS FOR LESSONS

Local Surroundings

COUNTRY, TOWN, VILLAGE

The country, if not too rough or rocky, is made up of farms or homesteads. On the farm are the farmhouse in which the farmer lives, barns and stables for his live stock and produce, fields, orchard, bush, etc. Neighbours live farther apart than in towns and villages. Why?

The village is not far away. What is a village? Name the nearest village. What roads lead to it? In villages the lots are much smaller than farms, the houses are close together, there is a post-office, one or more stores, shops, churches, etc. Why is a near-by village a benefit to the surrounding farmers?

The town is much larger than a village. What is the nearest town? What road or roads lead to it? Why is it sometimes called a market-town? What is a market? In a town the lots are small, the buildings are close together, and there are many stores, shops, factories, churches, and other buildings. The public school has a number of rooms or departments with a teacher for each, and there is a high school. What is a high school? The roads are called streets, are lighted at night, and there are side-walks to walk on. Many people work in its stores, factories, and offices.

ROADS

Roads are used for travel. They are called "public roads" because everybody has the right to use them. What is a lane? For what is it used? In the country, roads are known by different names, such as concession, side road, town-line or boundary. Concession roads usually run lengthways in the township; side roads are cross-roads used for getting from one concession to another. Town-lines or boundary roads separate townships. What is the name of your township? In towns what are roads called? Bridges and culverts are built on roads in order to cross streams and drains. What is the difference between a culvert and a bridge? Farmers living along the road are sometimes required to help to keep it in repair. Such work is called road-work, and the man who has the over-sight of it is known as the pathmaster. Why is he given this name? Roads are made better by grading up and by putting gravel on them. What is meant by "grading up" the road? Take imaginary drives to a near-by village, church, factory, etc., to show knowledge of roads. How did people travel in pioneer days before there were regular roads?

THE SCHOOL

The township is divided into school sections and a school is built in each. In what part of your section is the school placed? Is this the best place for it? Why? What is the name or number of your section? It is placed in charge of trustees who are elected by the people. What is meant by "elected by the people"? Give the names of the trustees. The work of the school is to train the boys and girls to become good citizens. When are men and women good citizens? Schools in the country are known as rural schools.

HOUSE OF REFUGE

When people become poor and friendless and too old or too feeble to make their own living, they are sometimes placed in a large home called a House of Refuge. Where is the House of Refuge for your district situated? Usually there is a farm in connection with it. Of what use would the farm be? The inmates get free board and lodging, are kept comfortable, and are kindly treated. Those who are able are given light work to do on the farm or in the house.

DIRECTION

UP, DOWN

Stand up. Sit down. Look up. Look down. Hold hands up. Take hands down. Point up. Point down. Lift foot up. Let foot down. Step up (on platform). Jump down. Throw the ball up. Throw the ball down. Which way is up the river? Down the river?

Which of the following statements is true:

Up to the sky or down to the sky? Why?
Up to the earth or down to the earth? Why?

What did the little bird mean when it sang:

So I flew down, down, down, through the air.

Up in the air I go flying again,
Up in the air and down.

Up in the maple tree, tree, tree,
Look, and a tiny nest you'll see.

Where is this nest? Why is it safer up there than down on the ground?

In a similar manner teach above, below, etc.

FRONT, SIDE, BACK, BESIDE, ETC.

Place a book and a box on the desk. Ask the pupils in turn to place the book in front of the box, at the side of the box, back of the box, beside the box, behind the box, over the box, under the box, beyond the box, between two boxes. Drill briskly.

Vary the exercise by asking Mary to stand in front of Jean, at the side of Jean, back of Jean, beside Jean, behind Jean, beyond Jean, between Jean and Helen, etc.

Locate A's farm with reference to other farms. It is beside B's, beyond C's, between B's and D's, etc.

RIGHT, LEFT

If the pupils do not know which is the right hand and which is the left hand, they must be told.

Raise the right hand. Raise the left hand. Which is the right-hand side of the body? The left-hand side? Shut the right eye. Shut the left eye. Touch the right ear. Touch the left ear. Put the right foot forward. Put the left foot forward. What is the boy's name who is standing on your right-hand side? On your left-hand side? When you are sitting in your seat, name the boys and girls who are sitting on your right. Who is standing on John's right? On Mary's left? Do you hold your pencil in the right or the left hand when writing? Do you know any one who writes with his left hand? When you are driving a team of horses, the horse on the right-hand side is called the "off" horse, and the one on the left-hand side the "nigh" horse.

EAST, WEST, NORTH, SOUTH

The directions *east* and *west* are readily learned in connection with the movements of the sun. It is popularly stated that the sun rises in the east and sets in the west.

Of course we know that this is not strictly true, but we do not need to consider, at this stage, the geographical accuracy of the statement. The pupil may be told that the sun rises in the east and sets in the west, and he may be drilled upon these directions.

In teaching the directions *north* and *south,* the pupil may be asked to stand at noon with his back to the sun, and told that he is facing the north and that the south is directly behind him. Ask him, while facing the north, to extend both arms sideways. In what direction is the right hand pointing? The left hand?

If possible, at this stage show the pupils a compass. From the knowledge already acquired, they will be able to tell that the compass needle is pointing to the north. Tell them that in this part of the world the needle of a good compass always points to the north. Give them practice in the use of the compass. They may now be told that the four directions, north, south, east, and west, are called the four chief, or cardinal, points of the compass.

Ask a pupil to walk northward, then eastward, then southward, then westward. At what end of the schoolroom is the teacher's desk? The door? In what direction does the road run? The river flow? In what direction does the wind drive the smoke to-day, etc.? Vary the drill as much as possible.

Next, consider a place to the north-west. Draw from the pupils that we may reach it (*a*) by going north and then west, or (*b*) by going west and then north, or (*c*) by going in a straight line toward it. Tell them that a straight line to such a place would run in a north-west direction. Show them the appropriateness of the name. Deal with north-east, south-east, and south-west in a similar way, and follow with the usual drill.

WINDWARD, LEEWARD

Stand outside when the wind is blowing. Point your finger in the direction from which the wind blows. Point in the direction toward which the wind blows. The direction from which it blows is said to be *windward;* and the direction toward which it blows, *leeward.* Watch the smoke from a chimney. Which is windward? Which is leeward? Why? When a kite is flying, is the tail to windward or to leeward of it? Why? Can you run faster to windward or to leeward? Why? When a cold wind is blowing, which is warmer, the windward or the leeward side of the house? Why? When the wind is blowing from the west, what direction is leeward? Why? What is windward? If the wind is blowing to the south-east, what direction is windward? Why? Get your father to make a weather-vane shaped like an arrow. Set it up. Does the arrow point to windward or to leeward? Why?

TIME

DAY, NIGHT, ETC.

Choose a sunny day for this lesson. What makes it so light to-day? Where is the sun now? Look. If you did not look at it, how could you tell that it is shining? (By the shadow it makes.) Where was the sun when you came to school? What time of day was it then? Where was your shadow? Where was the sun in the middle of the day? Where will it be when you are going home? Where will your shadow be then? Which is the shady side of the school-house before nine o'clock? Why? Which is the shady side at four o'clock? Why? Where does the sun go down? When does it go down? When the sun goes down we say that it sets, and the time is called sunset. What do we call the dim light before it

gets quite dark? (Twilight) When do we say it is night? When is it midnight? Where does the sun rise? When? What do we call the time in the early morning when it is just beginning to get light? (Daybreak or dawn) What name do we give to the early part of the day? (Morning) When is it evening? When is it noon? What name is given to that part of the day between early morning and noon? (Forenoon) Between noon and evening? (Afternoon) A.M. is a short way of writing forenoon; and P.M. of writing afternoon. Do not teach the origin of these abbreviations at this stage.

At what time of the year does it get dark very early in the evening? (In winter) At what time does it keep light until late in the evening? When does the sun rise on summer mornings? (Early) When on winter mornings? Which is longer, a summer day or a winter day?

What is meant by the following stanza:

> In winter I get up at night,
> And dress by yellow candle-light.
> In summer quite the other way,
> I have to go to bed by day.

MINUTE, HOUR

Let the teacher, watch in hand, tell the pupil to hold up his hand at a given signal and keep it up until another signal is given at the end of a minute interval of time. Tell him that he had his hand up for one minute. Next ask him to try the experiment without the final signal. The teacher will time him and tell him whether his time interval is too long or too short. How many times can a pupil walk back and forth across the room during a minute

of time? In such ways as these the pupil should get a general notion of the length of time in a minute interval. Practise counting one, two, three, etc., until you can count at the rate of thirty counts in a half minute.

When is school dismissed for dinner? (At twelve o'clock) When is it called in for the afternoon's work? (At one o'clock) How long a time did this allow for dinner and play? (One hour) How many minutes are there in one hour? (Sixty minutes) How long is the recess period? How many minutes are there in one half of an hour? In one quarter of an hour? What is meant by a twenty-four hour day?

WEATHER

WET, DRY, COLD, ETC.

These terms should be learned incidentally in connection with the daily weather observations recommended in Chapter IV.

Illustrations: What kind of day was Saturday? It was a wet day. Why was it a wet day? What kind of day is this? It is a dry day. What made the weather to-day dry? Was the rain on Saturday a benefit to us? Why? Why is it warmer to-day than it was on Saturday? The sun is shining to-day; on Saturday the sun could not be seen for rain-clouds.

WINDS

What is it that we breathe? Does air move? How do you know? Open a window on the sill of which some light pieces of paper have been placed. What happens to the paper? What caused the paper to move? Moisten your hand and hold it near the opening? What do you feel? What objects outside are moved by the air? What

name is given to air in motion? *Wind* is air in motion. In how many ways can you tell that wind is blowing? By sight, by hearing, and by feeling. Give examples of each.

Does the wind always blow from the same direction? What would you call a wind blowing from the north, etc.? A wind is named from the direction from which it comes. What is a west wind, etc.? From what direction is the wind blowing to-day? How can you tell? Toward what direction does a weather-vane point? Watch a flag flying and tell the direction of the wind. Watch moving clouds. What makes them move?

What is a cold wind? A warm wind? A gentle wind? A strong wind? A high wind? Why are north winds usually colder than south winds? How does the direction of the wind affect the weather? Why? What is a calm? A breeze? A gale? Do winds ever cause damage? Give instances of damage that you have known winds to do. Discuss the destructive power of wind in blowing down buildings, trees, crops, fruit, etc.

CLOUDS, FOGS

On frosty winter mornings, what do you see coming from your mouth when you breathe? This "breath" is really a little cloud. When the tea-kettle is boiling, what do you sometimes see coming from the spout? This "steam" is a little cloud. The steam that you see escaping from a steam-boiler is also a cloud. The steam, or vapour, seen rising sometimes from a river or lake or low ground is a cloud too. The clouds away up in the air are like these smaller ones only they are very, very much larger.

Why cannot we see the sun to-day? Is the sun shining now? If an air-man in his flying machine went up,

up, up, what kind of day would he find on the other side of the clouds? Why do you think so?

How high up are the clouds? Sometimes they come right down and rest upon the earth. What do we call such a cloud? We call it a fog or mist. Did you ever walk through a cloud to school? When air-men in their flying machines go through a cloud, it must be much like riding along the road on a foggy morning in an automobile.

Clouds move across the sky and are of many shapes and colours. Why are the clouds sometimes so very, very beautiful at sunset? What kind of clouds indicates that a rain storm is approaching? What sometimes fall from these thick, black clouds? Rain and hail. In very cold weather what may fall from them?

RAIN

The rain is falling to-day. Where does it fall from? What are some of the signs of an approaching rain? From what direction did to-day's rain-clouds come? Yesterday was a warm, dry day. What change of weather has been caused by to-day's rain? From what direction is the wind blowing? What is the effect of the wind upon the falling rain? Why is the ground more tiresome to walk upon than it was yesterday? What becomes of the rain that falls upon the ground? Why is there more water in the wells after a very heavy rainfall? Of what benefit is rain to the grass and to the growing crops? Why? If all the rain-water does not soak into the ground, what becomes of the surplus? Why is the water in streams and ditches so muddy-looking after a rainfall? Taste rain-water. How does its taste differ from that of well-water? Mix a little soap in rain-water and in well-water. What difference do you see? Which will make the better water for

washing purposes? Why do we say rain-water is "soft" water?

What is a rainbow? What different colours do you see in it? Try to make a drawing of it with coloured crayons. What causes the rainbow? (The sun shining through falling rain) In what part of the sky is it seen in the evening? In the morning?

What little creatures crawl out of the ground when it rains? Watch a robin hunting for earthworms.

Why is it dangerous to get one's clothes or feet wet? What should you do in such a case, in order to make sure that your health does not suffer?

THUNDER AND LIGHTNING

What do you sometimes hear when rain-clouds are passing? Thunder. What do you sometimes see? Lightning. Which of these two things is the more dangerous? Why will the thunder not harm us? It is nothing but sound. What are the two kinds of lightning? Chain- and sheet-lightning. How can you tell one from the other? Which is the kind that sometimes causes damage? What damage have you seen done by lightning? The "sheet lightning" is quite harmless. How can you tell when the lightning is not near? When it is near? The closer together the lightning flash and the thunder peal are, the nearer and the more dangerous the lightning is. Why is it not safe to stand under a tree during a thunder-storm? We would be much safer out in the open. Lightning-rods are sometimes put on a building to prevent the lightning striking it.

DEW

What is dew? Moisture on grass, etc. When does it "fall"? During the evening and night. Watch for dew

on cloudy nights. Do you find any? On what kind of night, calm or windy, does dew form? When there is little or no wind. Upon what does dew form? Upon grass, stones, etc., not usually upon boards or dusty roads. When does the dew disappear? What causes it to disappear? The sun. Of what benefit is dew? If the temperature is below the freezing-point, what happens to dew? What name is given to frozen dew? It is sometimes called hard, or "black", frost. White, or hoar-frost, is not frozen dew. In what seasons do we find white frost? In spring and autumn and sometimes in early and late summer. What damage is a hard frost likely to cause in late spring? In early autumn?

ICE

What is ice? How would you prove that ice is frozen water? Try these experiments: (*a*) Fill a glass bottle with water, cork it, and leave it out-of-doors on a frosty night. (*b*) Partly fill a tin vessel with water and let it freeze solid. What do you learn from these experiments? That water expands when changed into ice. What damage have you seen done by water freezing into ice? Water-pipes broken, etc. How does ice add to your winter's enjoyment? What games are played on ice? Of what use is ice in summer time? Explain how ice is kept through the hot weather. How can you make ice colder than it is? By breaking it up and mixing salt with it. How is ice-cream made? What is a refrigerator?

THE SUN

This lesson will give an opportunity to review previous lessons on associated topics, such as Day and Night, etc. As the class will return to this subject in Senior Form

III, all that is here required is to emphasize a few general notions not yet referred to. Proceed as follows:

What two benefits do we get from the sun? Heat and light. Is the weather equally hot all day? At what time of day is the sun hottest? At noon. Why? Because it is more nearly overhead at noon. When does it give us least heat? Place a screen between yourself and the hot stove. Why does the screen make you feel the heat less? Apply this to explain why cloudy days are not so hot as sunny days.

When is the shortest day of the year? A few days before Christmas. When is the longest day? About a week before the schools close for the summer holidays. How long does the sun shine then? How much daylight is there after four o'clock in summer? In winter?

Look at the sun through a smoked glass. What shape is it? How large is it? More than a million times as large as the earth. Why then does it look so small? Because it is so far away. How far away is it? It is so far away that, if you were to start now on a journey to it on a fast express train that never stops, you would die of old age before you would get half-way there; but you would reach the moon in about six months.

THE MOON

The pupils of Forms I and II should be required to observe the moon from night to night under the teacher's guidance, beginning with the new moon. This guidance may take the form of simple questions or suggestions given from day to day at school. Since the class will return to this subject in the Senior Form III, it is obvious that only such general introductory observations as are of special interest should be attempted at this stage.

At the end of a month the pupils should be able to answer intelligently such questions as are found below.

What is the shape of the moon when first seen? It is crescent-shaped. How many horns has it? Make a drawing of it on the black-board. What name is given to it? "New moon." Why is it called a "new moon"? Because it may be considered a "baby moon". In what part of the sky is it first seen? In the western sky. When is it first seen? Soon after sunset. What becomes of it? It, too, soon sets in the west. Watch it for a few nights. What change is taking place in its appearance? It is gradually getting larger. What change is taking place in its location? It is seen more to the east each night. What shape has it in about six days? It is like a half circle. Make a drawing of it. It is now said to be in its "first quarter". How big does the moon become? It becomes a full circle. What do we call it then? A "full moon". Make a drawing of it. How long a time is it since it was a new moon? Nearly two weeks. What do you see on the face of the full moon? Dark markings. Many people say that this is "the man in the moon". Nobody lives on the moon so, of course, it cannot be a man. Where does the full moon rise? In the east. When? Just after the sun has gone down. In what direction does the moon move across the sky? From east to west just like the sun. Watch the moon for some days after it has become full. What change in appearance do you notice? It is getting smaller. It becomes like a half circle once more, and we say it is then in its "third quarter". When does the third-quarter moon rise? Quite late at night. Does the moon rise at the same time each night? No, it is nearly an hour later each night. How long are we without any moon? About a week, and then

another new moon is seen. How long a time is there between two full moons? Nearly a month. Of what use is the moon to us?

Find the "Big Dipper" stars and the North Star, when the sky is clear. Of what use is the North Star to us? When we see it we know that we are looking straight north. When you are looking at this star, where is south? East? West? The North Star is larger than the sun, but it is so very much farther away that it looks very much smaller.

SEASONS

THE AUTUMN

Name the autumn months. Why is this season called the "fall" of the year? What change is gradually taking place in the autumn days as to their length? As to their temperature? Note the beautifully coloured leaves and how they brighten up the whole countryside. Why do leaves fall? The tree has no further use for them. What trees keep their leaves during winter? What preparation do the animals of the neighbourhood make in the autumn for their winter home? For their winter's food? What change takes place in their fur coats? Why do many birds fly away to the south in the autumn? When do they return? Describe the autumn work of the farmer in the harvesting of his corn, potato, fruit, and root-crops; in preparing food and shelter for his live stock for the coming winter; and in preparing his fields for the next year's crops. What preparation must boys and girls make?

What is a fall fair? A school fair? Tell what you see at these fairs.

HILLS AND STREAMS

HILLS

Look out over the countryside. What is its surface like? It is uneven or rolling. Point out the high places. What are these high places called? They are hills. What is the road between here and your home like? Why is it an up-and-down road? When is a road said to be level? Over what hills did you pass on your way to school? What do we call the sloping side of a hill? It is called its *slope*. What is meant by "up grade" and "down grade"? Over what part of the road do you find the walking easiest? Walking is easiest when the road is down grade. Why? Where do the horses find it hardest to haul a load? Why? What is the highest part of the hill called? It is the *top*, or summit. What is the land at the bottom of the hill called? It is its foot, or *base*. Draw a hill on the black-board. Mark its top, its slope, and its base. How is a hill road sometimes built in order to make it more easy to travel over? The earth is taken from the road at the top of the hill and is used for grading up at the bottom. How does this improve the road? It will not be so steep. Where is there a hill in the neighbourhood cut down in this way? On your sand-table make a hill and show how such a road may be made.

During a heavy rainfall or when snow melts on a hillside, which way does the water flow? Why do rivers or brooks flow along between hills? Why is it pleasant to live upon the top of a hill in summer? It is cooler. Why? What difference would there be in winter? Why? Which is warmer, the south slope of a hill or the north slope? Why? Which is easier to work, a hilly farm or a farm on level ground? Why?

A DITCH

(NOTE.—A ditch with running water is a river in miniature, and the class, by an observational study of it, may get much knowledge of rivers and their work.)

Which is better, a wet or a dry road? Why is the dry road better? What can road-makers do to make the road dry up quickly after a heavy rainfall? Are ditches usually made on one side only or on both sides of the road? Why on both sides? When a heavy rain falls upon a dusty road what becomes of the dust? What proof have you that some of it was carried into the ditch? Look carefully. Take a glass of mud-coloured water from the ditch and let it stand for a day or so. What is found in the bottom of the glass? Where did this mud come from? What does the ditch do with the mud that makes the water so dirty, when there is no current? When there is a current? How can you tell that there is a current? Throw some light bits of wood upon the water. In what direction does the water flow? Why does it flow in that direction? Running water shows which way the land slopes. Does the water flow uniformly at the same rate? Why not? Look for rapids and waterfalls. Is the bank wearing away in places? What is doing this? What becomes of the water that is flowing down the ditch? As soon as a ditch dries up, look for the mud that was in the water. Where do you find it? Will this mud fill up the ditch in time? Why do you think so? What repair will the ditch need then? Will the road need repair too? Why?

At the close of these observations, which will require considerable time, require the pupils, using the sand-table for illustration when possible, to tell orally the story of a ditch—how it was made, how it drains the road of

both water and mud, how this improves the road for a time, how the ditch gradually fills up, and how both road and ditch will in time need repair, the road by being graded up, and the ditch by being cleaned out.

ACTIVITIES OF THE HOME

BREAD, FLOUR, WHEAT

Of what is bread made? How is flour made into dough? What is put into the dough to make it "rise"? Tell how it is made into loaves and cooked.

Of what is flour made? Where is wheat made into flour? What else besides flour is obtained from the wheat? Take your knife and pick off the thin, skin-like coat of a grain of wheat. It is this outer part that becomes the bran. Of what use is bran? What part of the grain becomes the white flour? How is wheat made into flour at the mill? By crushing it between iron rollers.

From whom does the miller buy wheat? Where does the farmer obtain it? Name two kinds of wheat. Why is one kind called "spring" wheat and the other kind "fall" wheat? What kind is grown at your home? Tell how the farmer prepares the field before sowing the seed wheat. Tell how he sows the wheat. When is the wheat ready to be harvested? Tell briefly how he harvests and thrashes the wheat.

Review: Tell a "story" about each of the following: (*a*) How the farmer grows wheat, (*b*) how the miller makes flour, and (*c*) how the baker makes bread.

THE FARM

Workers on the farm are called farmers. The land that the farmer owns or works is his farm, and it is separated from adjoining farms by line fences. What are

line fences? Farms are usually divided into fields of various sizes. What crops are grown in these fields? What is meant by a "grain crop"? A "hoe crop"? What grows in a meadow? For what is a pasture field used? Of what use is the bush? The products of the farm are grain, hay, roots, potatoes, fruit, live stock, butter, eggs, etc. To whom does the farmer sell these things?

In each of the following cases, which farm is likely to be worth more money:

(*a*) One near a market-town or one far away? Why?
(*b*) One near a railway station or one far away? Why?
(*c*) One near a school or one far away? Why?
(*d*) One infested with weeds or one that is clean? Why?
(*e*) One with good roads near by or one with bad roads? Why?

THE STORE

Locate the nearest store. The man who keeps the store is called a store-keeper or merchant, and his helper a clerk. Name different kinds of stores. What is a grocery store? A dry goods store? A drug store? A hardware store? A book store? A flour and feed store? A "general" store is one that sells nearly everything that is needed, such as groceries, dry goods, boots and shoes, etc. Why are most country and village stores usually general stores? Why do your parents buy groceries, dry goods, hardware, etc.? These things are not produced at home. What things do farmers sell or exchange at the store? Why do they do this? More of these things are produced at home than are needed. What is meant by buying "for cash"? By buying "on credit"? By taking goods "in trade"?

CHEESE FACTORY

From what is cheese made? What is the place called in which cheese is made? From whom is the milk obtained? How is it carried from the farm to the factory? Why is it weighed at the factory? What two things are made from the milk? Whey and curd. What is done with the whey? It is fed to the pigs. What is done with the curd? It is pressed in moulds until it becomes cheese. How old should the cheese be before it is good to eat? It should be at least six weeks or two months old, but if it is older than this it will make still better food.

THE RAILWAY

What is the name of the nearest railway? Through what near-by places does it run? The place where trains stop to take passengers or freight on or off is called the station. What is meant by freight? Name different kinds of freight. What is the name of the nearest station? What is a railway train? Describe a passenger coach, a freight car, the engine, and the use of each. What are the duties of the engineer, the fireman, the brakesman, the conductor? The man who has charge of the station is called the station agent. He sends messages to other stations by telegraph or by telephone. What is the meaning of the "ticking" heard in a telegraph office?

A railway operated by electricity is called a trolley line, and the cars, electric or trolley cars. In cities and towns they are usually called street-cars. What is the use of the overhead wire? The trolley pole? The man who runs the car is called the motorman.

CHAPTER VI

FORM II

DETAILS OF THE COURSE

RECOMMENDATIONS TO TEACHERS

To COMPLETE the Course in Geography for Form II will require from one year to one and one-half years, depending upon the ability of the class.

It is not required that the topics should be taught in the order outlined below. Any logical order of topics may be taken, provided that the class has had the necessary preliminary preparation for the understanding of the subject-matter.

A record should be kept of all lessons taught, to prevent unnecessary repetitions or omissions.

In rural schools it will be found advantageous to combine classes whenever possible. For example, the Senior Grade of Form I may be combined with Form II for much of the subject-matter included in the sections numbered 4, 6, 9, and 10. If pupils of the Junior Grade of Form III are found defective in the subject-matter of Form II, they may find it profitable to join the latter for reviews.

That the "Suggestions for Lessons" in this Grade are well within the comprehension of ordinary Form II pupils has been demonstrated by careful tests made in the schoolroom by competent teachers. The observation method makes the work very interesting and practical, and the pupils find little difficulty in understanding facts and relationships which, if taught by the old non-observation methods, would be for the most part hazy and theoretical.

1. LAND AND WATER FORMS

(1) The ideas obtained from observations of local hills, valleys, and plains extended to include ideas of mountain, range, volcano, watershed or divide, plateau, pass, promontory.

(2) The further study of a local stream as to origin, direction, size, work (drainage, erosion, transportation), to develop such terms as river, tributary, source, channel, current, mouth, estuary, delta. Emphasize the erosive power of rivers in cutting down the valleys through which they flow, and their carrying power in transporting soils to lower levels.

The river basin, its watershed, its source of water-supply (rain and snow), its springs, drains, and swamps, and its system of river and branches.

(3) General notions of continent, ocean, sea, strait, gulf, bay, lake, canal, island, cape, peninsula, isthmus. A physical geography chart of these type forms will be found very helpful. Pictures are also very effective in this connection.

(4) Representation by the pupils of the above types of land and water forms by modelling in sand or clay and by drawing. Sand-tables should be used very sparingly by the teacher during the teaching process, but the pupils may afterwards use them freely, as a means of expressing notions that have been taught to them.

For hints on teaching the following topics, see "Suggestions for Lessons", Chapter VII: Mountains; a river; river basin; the ocean; shore forms.

2. THE WEATHER AND THE SEASONS

(1) Winds: general notions of their cause, direction, force, and uses.

(2) Nature and origin of clouds, fogs, dew, frost, rain, snow, hail, etc.

(3) The seasons: changes, characteristics, general causes.

(4) Simple weather records.

For hints on teaching the following, see "Suggestions for Lessons", Chapter VII: Winds; rain; the seasons; variation in the length of day and night.

3. OUTLINE STUDY OF THE EARTH AS A WHOLE

(1) The earth: form, size, surface.

(2) The continents and oceans and their relative positions. Use the globe at first, the map of the world afterwards. Do not use the Mercator map at this stage, as it may give wrong impressions of distance and areas.

For hints on teaching "The Earth as a Globe", see Chapter VII.

4. LOCAL GEOGRAPHY

Much local geography has already been taken in preceding portions of the Course. In addition the following may be taken:

(1) Names and locations of particular local streams, lakes, hills, roads, capes, islands, etc.

(2) Township and county geography, with the principal towns, villages, highways, etc.

For hints on teaching "The Township", see Chapter VII.

5. MAP DRAWING

The following order is suggested for the development of plans and maps:

(1) Simple objects in the school-room, for example, the teacher's desk or table.

(2) The school-room, showing location of stove, teacher's desk, door, etc.

(3) The school grounds.

(4) Some neighbouring farm.

For variety, models in sand or clay may be made of some particular farm, the school section, or the township, and then plans or maps may be made of these models.

For hints on teaching maps, see Chapter VII.

6. COMMERCIAL GEOGRAPHY

(1) Local marketing: grain, live stock, fruit, butter, cheese, milk, eggs, and other farm products; wood, pulpwood, fish, etc.

(2) Local industries and their products: lumber, cheese, pulp, paper, furniture, woollen goods, clothing, flour and meal, leather, boots and shoes, cured meats, implements, machinery, brick, cement, lime, etc.

(3) Raw material obtained in the locality: building stone, limestone, marl, marble, timber, pulpwood, tan bark, hides, iron ore, etc.

(4) Distribution: local means of transportation: roads, railways, water-ways; local collecting and distributing centres, such as implement agencies, elevators, etc.

7. PLACES OF GEOGRAPHICAL INTEREST IN THE NEIGHBOURHOOD

Sand dunes, shores worn by waves, ravines cut by running water, gravel-pits showing layers of gravel and sand, deposits of boulder stones, quarries, crumpled or tilted rock layers, glacial-marked rocks, "pot-holes", streams flowing from springs, meandering streams in plains, etc.

8. PLACES OF HISTORICAL INTEREST IN THE NEIGHBOURHOOD

Location of places of historical interest. Many of these are on or near the United States boundary, particularly along the St. Lawrence River, the north shores of Lake Ontario, the Niagara River, and the Detroit River. In addition to these, there are Indian reserves, old Indian camping and burial grounds, old buildings or places associated with early pioneer days, birthplaces of famous men, etc.

9. THE PEOPLE OF THE LOCALITY AND THEIR NATIONALITIES

Canadians, English, Irish, Scotch, Welsh, Americans, French, Germans, Italians, Chinese, etc., as the case may be. General notions of the location of the countries from which these people came.

10. CHILD LIFE IN OTHER LANDS

Stories, illustrated by pictures, of child life in other countries, particularly in those countries whose conditions and customs are widely different from ours. Examples: Eskimo, Indian, Chinese, Japanese, Hindu, Turk, Negro, etc.

Children of public school age are likely to be much more interested in the lives and activities of other children than in those of adults. Hence such topics as the following should make appropriate material for class stories:

The appearance of the children, their games, toys, pets, clothing, what they eat, what they study at school, what their homes are like, occupations of the people, how they travel, climate and products of the country, the animal and bird life, strange sights to be seen, etc.

CHAPTER VII

FORM II

SUGGESTIONS FOR LESSONS

MOUNTAINS

WHAT is a mountain? (Show a picture.) It is a very high hill. Very few hills in Ontario are high enough to be called mountains. How high must a hill be before it may be called a mountain? There is no fixed rule for using the term mountain. What is called a mountain in one part of the country would simply be called a hill in another. For example, in some localities a hill about 500 feet high is called a mountain; in other localities, it would need to be over 1,000 feet high to be considered as such. When we speak of the height of a mountain we mean its elevation above the level of the sea. Explain. Some mountains are so low and their slopes are so gentle that one may climb to their tops without much trouble. Others are so high and their sides are so steep that it is difficult and often impossible to reach their tops. The height of the highest mountain in the world is about five and one-half miles. Their tops may rise far above the clouds and are often hidden by them.

Examine as many pictures of mountains as you can find. What shape is the top of a mountain? It has many shapes—sometimes rounded, but often irregular. The top of a mountain that is much higher than the country about it is called a *peak*. What is the colour of the high mountain tops seen in pictures? Why are they white? They

are covered with snow and ice. About two miles above us the atmosphere is so cold that snow will not melt. This is why very high mountain tops are always buried in snow and ice. A large mass of this snow and ice sometimes becomes loosened and slides down the mountain side causing great damage. This is called an *avalanche.*

What name is given to a row of mountains? These ranges, or chains, are sometimes hundreds of miles in length. Why does such a mountain range make a good watershed, or divide? What becomes of the rain that falls upon a mountain range? Which side of the range will have the greater rainfall, the windward or the leeward side? Why? In what ways does a mountain range hinder trade and travel? Where is the best place for crossing a mountain range? What name is given to such a crossing place? It is called a *pass.* Why was this name given to it? Why do railways always cross mountains through these passes?

Of what materials are mountains composed? Rock when exposed to the weather gradually crumbles away. What name is given to powdered rock? What becomes of the soil that is thus formed? Most of it is washed away and leaves the rocks bare; part of it covers the sides of the mountain farther down. This makes it possible for forests to grow on mountain sides. Do you see these forests in the pictures? Why can not trees grow on very high mountain tops?

Metals, such as gold, silver, iron, etc., are usually found in rocks. Why are these metals so often found in mountainous countries? Why do fewer people live in mountainous countries than in lowland countries? How do mountaineers make their living? Do they cultivate the land much? Why not? They hunt, pasture sheep, work

in mines, etc. What name is given to men who hunt? To those who care for sheep? To those who work in mines? Name some wild animals that live in the mountains. Why do many people go to the mountains for their health? Give reasons why most people find it more pleasant as well as more profitable to live in the valleys rather than up among the mountains?

Make black-board sketches and sand and clay models of mountain, mountain range, pass, and valleys. Use chalk dust to illustrate the snow-capped peaks.

A RIVER

Make an examination of a brook near the school. Where does the water come from? Is there a spring, or a swamp, or a tile-drain in the neighbourhood? If so examine it carefully to find out what contribution, if any, it makes to the water-supply of the brook. In what direction is the brook flowing? Why does it flow in this direction? What is meant by the *source* of the brook? What is its *mouth*? What evidence can you find that the brook is growing larger as it flows along? What name is given to the smaller streams that flow into it? What is the name given to the land bordering each side of the brook? Which is the right bank? The left bank? The *bed,* or *channel,* of the brook is the land between the banks and over which the water flows. Why does a larger stream dig out a deeper channel for itself than a smaller stream does? The larger stream is stronger and can do more work.

Is the current flowing at a uniform rate of speed? Test by throwing pieces of wood or leaves upon the water. Why is the flow faster in some places than in others? What kind of bottom has the brook where the current is slow? Why is it covered with mud or fine sand? In

what parts of the stream is the bottom covered with coarse gravel or stones? Account for this. Why is the water muddy after a heavy rainfall? Where did the mud come from? Why does it settle to the bottom where the current is slow rather than where it is swifter? If there is a pond in the neighbourhood, compare the colour of the water flowing into it after a rainfall with that of the water flowing over the dam. What becomes of much of the mud that is carried into the pond? If this were to continue for many, many years, what would probably be the fate of the pond? Show how swamps may be formed by natural ponds filling up with soil.

When the brook bends, what part of the current has the most speed? Test to find out. What is the effect of this upon the bank? Why is it being worn away? What kind of banks are worn away more rapidly, grassy banks or banks that are bare? Why? Find places where trees or bushes help to protect the banks. How do they do this? Explain why the brook tends to become more winding as the banks are worn away by the bending current.

Construct a paddle-wheel. Hold the wheel so that the ends of the paddles are in the flowing water. What makes the wheel turn? What useful work can moving water do? How? Why are dams built across streams? Note that many mills, factories, and electric power plants are operated by falling water. Mention other ways in which streams are useful to man. They drain the country of surplus water, supply water for man and beast, irrigate the land, furnish food fish and fur-bearing animals, and, if large enough, form a water-way for ships. By picture and description appeal to the pupil's imagination, in order that he may acquire definite notions of the great rivers at a distance.

A RIVER BASIN

It is of the greatest importance that the pupils should have a definite notion of *river basin.* This may be obtained by means of a few simple experiments and observations, followed by the study of a local stream.

Place an empty basin or pan out-of-doors during a rainfall, and note:

(*a*) That the water afterward found in the basin was supplied by the rain—there was no other source of supply.

(*b*) That the only rain-water that entered the basin fell within the limits of its rim.

Have the pupils observe the roof of the school-house during a rainfall. By means of questions, guide their observations until the following facts are established:

(*a*) That the ridge or watershed of the roof separates its two slopes and thus determines the direction in which the rain-water must flow.

(*b*) That at the foot of the sloping roof there is a drain (eaves trough) to carry away the water.

(*c*) That the water flows from the higher end to the lower end of this drain trough.

Next, the pupils should, if possible, observe a small, neighbouring stream whose basin is limited and therefore suitable for study. After they have carefully observed the stream and its slopes, help them to discover and to trace the watershed, or divide. Tell them that the land inclosed within this watershed and drained by the stream is called its *basin.* Refer to the experiment of the pan or basin to bring out the two points of resemblance between the two basins with respect to the rainfall. Then emphasize the drainage idea by referring to the conditions observed in connection with the school-house roof and by

showing that somewhat similar conditions exist in the basin of the stream.

Where does the stream get its supply of water? Why does the stream flow along so steadily day after day? The explanation of these phenomena is somewhat difficult to understand at this stage. Observations show that the sources of water-supply are swamps, springs, and drains. These are fed by the rain and the snow that fall within the limits of the basin. Fill a large sponge with water to saturation and place it upon a slanting board. Water continues to flow from it for some time. This illustration will help the pupils to understand how swamps, springs, and drains provide a continuous water-supply even when it is not raining. A swamp is very much like a huge sponge filled with water.

These observations must be supplemented by verbal descriptions, pictures, black-board sketches, sand-table work, etc., until the essential features common to river basins are understood by the pupils.

The sand-table exercise may be carried on by the pupils as follows: Cover the surface of the sand-table with white paper and spread a quantity of slightly moist sand over it. Arrange the sand to represent the river basin with its watershed. Trace the courses of the brook and its tributaries. The white paper showing through the sand will show these courses very plainly.

The essential features referred to above may be summarized as follows:

(*a*) The river basin is contained within a watershed, or divide, which separates it from neighbouring basins.

(*b*) The river drains the whole tract of country embraced within the basin.

(*c*) An extensive river basin may have as many smaller basins within it as the river has branch streams.

(*d*) The land surface of the river basin slopes down to the river from both sides. The river flows along between slopes to its outlet, or mouth, which is at the lower part of the basin.

(*e*) The river has its source in springs, swamps, etc. These receive their water-supply wholly from the rain and snow that fall within the limits of the basin.

THE OCEAN

What becomes of all the water that rivers are carrying away? If you could float along upon the river in a little boat for days and days, you would finally reach the ocean. Let us learn a few interesting things about it.

Examine a picture of the ocean as it appears from the shore. Tell what you see. What colour is the water? It is a greenish-blue, but when there are clouds over it, it looks dark and gloomy. Find a picture of the ocean in a storm. What do you see? What happens to the waves when they strike the shore? Why is it dangerous for ships to be near the shore when a storm is raging? How are sailors warned of their danger in the darkness of night? What are harbours? Of what use are they?

How large is the ocean? It is thousands of miles long and in places thousands of miles wide. Many men have actually sailed on it all the way around the world. How deep is the ocean? Most parts of it near the land are shallow, but far out from shore it is in many places two miles deep, and in some places four or five miles deep.

As there are so very many rivers flowing into the ocean, why does it not fill up and overflow its banks? It can-

not do this because most of the rain-drops that fall from the clouds in all parts of the world come from the ocean. You will learn about this in another lesson.

Is the water of the ocean fresh or salt? How would you account for the ocean being salt? Nearly all soils and rocks contain salt of different kinds. Some of it gets into the rivers and is carried away to the ocean. To learn how the water of the ocean became salt, try the following experiment: Fill a saucer with water in which some salt has been dissolved. Taste the water. Set the saucer where it will be exposed to the outside air for a day or two when the weather is warm. What became of the water? Did the salt disappear too? What proof have you that it did not? The water in the ocean is much like the water in the saucer in one respect. Great quantities of it disappear into the air to help to form clouds and rain-drops. The salt that the rivers carried to the ocean is left there, making its water salty. Indeed, it is so salt that no one would think of drinking it even if he were dying of thirst.

Why do some people go to the sea-shore in summer time? How do the people at these summer resorts pass the time? They walk upon the sandy beach, breathe the fresh air, and bathe in the cool, salt water.

SHORE FORMS

What name is given to the land bordering on a pond or lake or sea? It is given different names, such as coast, or shore. Examine the shores of a pond or lake. Usually they are not straight but are more or less curved or bent. If there is no pond or lake near by, examine the pools by the roadside or in a field after a heavy rainfall. (A physical geography chart of land and water will greatly

help here in imparting correct notions. Such a chart should be placed in every school.)

What do you call this point of land that juts out into the water? It is a *cape.* Find other capes. Here is another but larger mass of land jutting out into the water. Note that it has a neck-like part joining it to the mainland. The large mass of land just beyond the neck is almost surrounded by water. What name is given to this land? It is a *peninsula.* The neck of land joining it to the mainland is called an *isthmus.* Find other peninsulas and isthmuses. What is the point of land at the end of the peninsula called? What is a cape? Look at that land out there in the water. How would you describe it? It has water all around it. What shall we call it? It is an *island.* If the peninsula were to become separated from the mainland by having its isthmus washed away, why would we have to change its name? What would it have to be named? Why? What is the chief difference between an island and a peninsula? What is an island? A peninsula? An isthmus? Find as many pictures as you can of islands and capes.

Now take your sand-table and reproduce the above land forms, using damp sand to represent the peninsulas, islands, etc., and white paper or glass to represent the water.

Deal similarly with such water forms as gulfs, bays, straits, etc.

Finally, by oral description and especially by pictures, try to get clear notions of these land and water forms as they exist in the ocean; there are the great capes, bays, islands, straits, etc., of the world.

WINDS

Why do you like to fan yourself when you feel hot? Why does this make you feel cooler? When the face is hot, the air next to it becomes hot too. The breeze from the fan drives away the hot air and cooler air takes its place. If this is kept up for some time, you feel much more comfortable.

What is a calm day? Why do you feel so uncomfortable on a calm, hot day? If a breeze begins to blow on such a day, why are you likely to feel more comfortable? What effect has wind upon the weather? Winds usually make the weather cooler.

Wind is air in motion. (See lesson on "Winds", Form I.) What causes air to move? Let us try to find out. Strike two chalk brushes together over a hot stove. Why does the chalk dust rise to the ceiling? The heated air carries it up. What causes the heated air to rise? The heat of the stove causes it to rise. Heat, then, must have something to do with the movement of air. Think of other examples of heat causing air to rise. Steam from a cup of hot tea, cinders and smoke from a fire out-of-doors, etc. Watch the movement of smoke in a room where there is a lighted lamp. See how the smoke floats toward the lamp and then rises above it. Hold the palm of your hand at different heights above a cup of hot tea. Do likewise over a cup of cold water. What difference do you observe? Why do you feel heat above the hot tea and not above the cold water? The reason is that air is rising from the former but not from the latter. What takes the place of the heated air after it has risen from the stove? Try to find out by striking the chalk brushes together at the side of, and below the stove. Cooler air from the floor takes the place of the heated

air; it quickly becomes warm and in turn rises. This action of the air continues as long as there is fire in the stove. Make a drawing on the black-board that will show the movement of air in a room, caused by the hot stove.

Raise the window a little at the bottom and lower it at the top. Test the air currents with the chalk brushes. What causes the cool draught (or wind) to enter below? Why does the warm air go out above? The reason is that the hot stove makes the air lighter, and therefore it rises to the top just as cork rises in water. At the same time the cooler and heavier air pushes in at the side to take the place of the heated air that has risen. In this way a current or movement of air is kept up.

Is there anything like this taking place on a large scale out-of-doors? What is it? The sun makes some places hotter than others. Over such places the heated air rises and the cooler air from neighbouring places flows along to take the place of the heated air. When we feel the cool air rushing by on its way to do this, we say the wind is blowing. In all parts of the world there is a movement of the air from colder to warmer regions. This movement of air over the earth is called *wind.*

Why are north winds usually cooler than south winds? What winds usually bring rain? Fair weather? When clouds cover the sky and the south wind blows, it is a sign of rain. After the rain ceases, the wind changes and becomes a north or a west wind, the clouds are blown away, and we have fine weather. Why is there little or no dew on a windy night? If the air is hotter over the land than over the lake, which way will the wind blow? On or near a large lake, why have we breezes blowing *toward* the lake in the mornings and *from* the lake in the evenings? At what time of a summer's day do we usually

have least wind? Where do people go in summer to get cool breezes? Why? What useful kinds of work can winds do?

By keeping a daily record of the direction of the wind and of the kind of weather that it brings, you will be able to discover for yourself which winds are most likely to cause fair weather and which rainy weather. You should be able, too, to read the thermometer and record the daily temperature. Below will be found a form of weather record suitable for public school purposes.

WEATHER RECORD

Date	Time of Day	Direction of Wind	Kind of Weather	Temperature	Remarks

RAIN

Make the following observations:

(*a*) That, when a pan of water is set out-of-doors for a day or so, the water will disappear. What became of it? Why can you not see it in the air? What name is given to water that disappears into the air in this way? It is called *vapour,* and we say that the water has *evaporated.* If the pan is placed on a hot stove, the water will disappear more quickly. Why?

(*b*) That the water in a salt and water solution will evaporate, leaving the salt behind. (See lesson on "The Ocean".) What does this teach us?

(*c*) That ink-wells in a warm school-room, if left uncovered, will soon become dry. Why?

(*d*) That wet clothes hung on a line out-of-doors will soon become dry. Why?

(*e*) That the sun and the wind will soon dry up roads and fields after a rainfall. Why?

From these observations we learn that water may be changed into an invisible water vapour and that heat will hasten the process. This water vapour is continuously rising from the surface of every body of water exposed to the air. It is rising from the ocean, from all lakes and rivers, and even from the ground wherever it is damp. What a large amount of water there must be in the air although we do not see it!

Now, how does all this invisible water that is in the air get back to the earth? Perhaps the following observations may help you to answer this question:

(*a*) Have you ever observed on a warm summer day that the sides of a pitcher of cold water will "sweat"? Where did the water that collects on the outside of the pitcher come from? Why are you sure that it did not come from the inside of the pitcher? What has really happened is that the pitcher cooled the invisible water vapour in the air near it and caused it to form in drops on its cold sides. We say that the vapour *condensed* on the sides of the pitcher.

(*b*) Observe that the window panes of the kitchen are often covered in cool weather with water, especially on "wash" days. Why? The invisible vapour from the boiler on the stove condensed on the windows.

(*c*) Observe the little white clouds formed by your "breath" on a frosty day. Why do you not see it on a

warm day? It is not cold enough to condense the water vapour that is in the breath.

(*d*) Observe the "steam" that sometimes rises from a river, or pond, or lake. Under what weather conditions do you see it? It rises only when the air is colder than the water. What name should we give to this so-called "steam"? We should call it fog, but it is really a cloud.

What do the above observations teach? They teach:

(*a*) That invisible water vapour floating about in the air may be changed back into water by coming in contact with a cold surface. The formation of *dew* may be thus explained. The earth after sunset cools faster than the air. This cooled earth cools the water vapour in the air next to the earth, and consequently water condenses upon the cold grass, stones, etc., just as it condensed upon the cold pitcher or upon the cold window pane. On very cold nights this water vapour freezes on grass, stones, etc., and forms *white frost*. True frost is not frozen dew.

(*b*) That warm winds sometimes carry the water vapour with which they are laden many miles, until it reaches a region where the air is very much colder. What happens to the water vapour when the cold air of this region chills it? It condenses into a great mass of very tiny water drops called a cloud. Sometimes these clouds form high up in the air. Why? It is because it is so cold up there. (See lesson on "Mountains".) Why are clouds so often seen round the tops of high mountains?

Why is a cloud able to float in the air? The tiny drops of water of which the cloud is composed are so very, very small and so very, very light that they do not fall. Perhaps the following experiment may help you to understand this: Powder a piece of chalk until it is as fine as dust. Drop some of this dust into a dish of water. Why

did it not sink to the bottom? The dust-like particles are so small and light that they float. Next, break up a lump of chalk into pieces about the size of peas and drop them into the water. What happens to them? Why did they sink? What does the experiment teach us? It teaches us that if the pieces of chalk are small enough, they will float in water, but if they are considerably larger, they will sink. Drops of water in the air act in a similar way. If they are small enough, they will float in the air; but, if they are large enough, they will fall to the earth.

When a cloud becomes still more chilled, what happens to its tiny drops of water? They unite to form larger drops and these fall to the earth as *rain.*

Snow is formed when the tiny droplets which form the cloud freeze. Each frozen droplet becomes a crystal of snow. When a large number of these tiny crystals cling together, they form a *snowflake.* The white mantle of snow that covers the earth after a snow-storm is really a frozen cloud.

Hail is probably frozen rain-drops or a mixture of rain and snow frozen.

THE SEASONS

Name the four seasons. Why do the seasons change four times a year? Let us try to find the reason by observing the sun's shadow during the year. For this purpose drive a stake into the ground in a sunny place. Have it about three feet high and wide enough to cast a distinct shadow. The observations should be carried out during the whole year and may be begun at any time.

Measure the length of the shadow of the stake at 9 a.m., at noon, and at 4 p.m. When is the shadow shortest? Why is it shorter at noon than at 9 a.m., or at 4 p.m.? When it is shortest the sun has reached the highest point

in the sky for that day. It is at noon that shadows are always shortest. At what time of day is the sun hottest? Why? It is hottest then because the sun is most nearly overhead.

Just here you may, incidentally, make the following observations: When the shadow of the stake on any day is shortest, that is, when it is exactly 12 o'clock noon, lay the straight edge of a board along the shadow and, with a sharp-pointed stick or with a mixture of lime and water, mark a straight line on the ground. Note that every day at noon, no matter what the length of the shadow may be, it always lies along this line. What name may be given to this line? We may call it the "noon line", another good name is "meridian line", as the word *meridian* means mid-day. In what direction does this meridian line run? It is always a north and south line. Whenever the end of the shadow reaches this line we know that it is noon without consulting the clock.

Is the sun at the same place in the sky at noon all the year round? Try to find out by watching the shadow cast by the stake. Suppose that we begin observations about September first. With a tape-line or yard-stick measure the shadow twice a month. Be sure that the measurement is taken always exactly at 12 o'clock noon. Keep a record of these measurements. Also keep a record of the number of hours and minutes between sunrise and sunset on the days on which you measure the shadow. Get the latter information from a good almanac and test its accuracy occasionally as you find opportunity. The following form will serve for preserving records:

DEPT. OF EDUCATION
HISTORICAL COLLECTION

RECORDS

Date of Observation	Length of Shadow	Time Interval between Sunrise and Sunset

If the day set for the observation is cloudy, take the first sunny day that follows. Note that a straight rod with one end placed at the end of the shadow and resting upon the top of the stake will always point directly to the sun.

What was the length of the shadow at the beginning of September? On September 21st? Mark the end of the shadow on September 21st by a peg driven into the ground. Why is the shadow growing longer? It must be because the sun is getting lower down in the sky. In what part of the sky is the sun at noon on September 21st? It is on this date that the day and night are equal in length. It is for this reason that it is called an equinox and, as this is the time when autumn begins, it is called the *autumn equinox*. This is the real end of summer and the beginning of autumn.

Continue making measurements at least twice a month as time passes. As the shadows are getting longer, what change is gradually taking place in the position of the sun? What change is taking place at the same time in the length of time that the sun is shining each day? What change is taking place in the weather? It is gradually getting colder. What is causing the weather to

become colder? There are two reasons why the weather is becoming colder, namely: (*a*) The sun is gradually getting lower down in the sky and cannot give us as much heat as it did. (*b*) As the days are gradually getting shorter, we are getting less heat daily from the sun.

When is the shadow longest? On or about December 21st. Drive a peg into the ground to mark the end of the shadow. Note that the shadows have gradually been lengthening ever since you began your observations in September. *When the shadows at noon are lengthening from day to day, it is a sign that winter is coming.* December 21st is the shortest day in the year, and it is on this date that winter really begins. How long did autumn last? It lasted for three months—from September 21st to December 21st.

How do the shadows change after December 21st? They gradually become shorter. What corresponding change is taking place in the position of the sun in the sky? What change is also taking place in the time during which the sun is shining each day? When are the day and night again equal in length? On March 21st. This is called the *spring equinox.* Why? It is on this date that winter is said to end and spring to begin. How long has winter lasted? How does the length of shadow on March 21st compare with its length on September 21st? Why are the shadows the same length? The sun on its journey back has reached the same part of the sky it was in last September.

Note that, after this date, the shadows continue to shorten, and that the time during which the sun is shining each day also continues to lengthen. What change in the weather is taking place? It continues to get warmer

and warmer. Why? Give two reasons. *When the shadows at noon are shortening as the days go by, it is a sign that summer is coming.* When is the shadow shortest? On or about June 21st. Drive a peg into the ground to mark the end of the shadow at this date. How many hours of sunshine are there on June 21st? This is the longest day in the year. Where is the sun at noon? It is the nearest overhead to us that it ever gets. It is on June 21st that spring ends and that summer begins. After this date the shadow begins to lengthen once more.

What season begins when the end of the shadow reaches the peg nearest the stake? The peg farthest away from the stake? What seasons begin when the end of the shadow reaches the middle peg? By using a straight rod, the corresponding positions of the sun in the sky on these dates are readily found.

Some of you may observe the shadow of the stake a few times during the summer holidays, noting the dates of observation and the lengths of the shadow. By doing this you will secure most useful records covering the entire year.

There is another factor influencing the changes in weather that should perhaps be referred to. It is very closely related to the two factors already mentioned. Why does the hottest weather come *after* the longest day of the year (June 21st)? We have already learned that after March 21st the sun actually shines more than twelve hours each day. It follows, therefore, that the earth is receiving more heat in the daytime than it loses by cooling at night. This surplus heat is stored up in the earth and is gradually making the earth warmer. Hence, there is more of this surplus heat in the earth in July and in August than in June. The great heat that we feel during

July and August is, therefore, owing to the heat from the direct rays of the sun, together with that given off from the heated earth. It is because of the heat from both these sources that July and August are the hottest months of the year.

In a similar way it can be shown that our coldest weather is *after* the shortest day in the year (December 21st). During January and February most of the heat of the sun's rays is used up in warming the cold earth; there is little radiation of heat to warm the air. Heat conditions, however, gradually improve as spring approaches.

The facts learned by the above observations may be summarized as follows:

(1) The longest day of direct sunlight is on June 21st; the shortest, on December 21st; day and night are equal in length on March 21st and on September 21st.

(2) Autumn begins on September 21st; winter on December 21st; spring on March 21st; and summer on June 21st. Each season is therefore three months in length.

(3) The sun's shadows gradually lengthen during summer and autumn, and shorten during winter and spring.

(4) It is just when the sun has reached its highest place in the sky that our summer begins, and it is just when it has reached its lowest place in the sky that our winter begins.

(5) Our seasons are therefore caused by the following related factors working together:

(*a*) The sun gradually changing its place in the sky.

(*b*) The variation in the length of time during which the sun shines each day.

(*c*) The gradual warming and cooling of the earth.

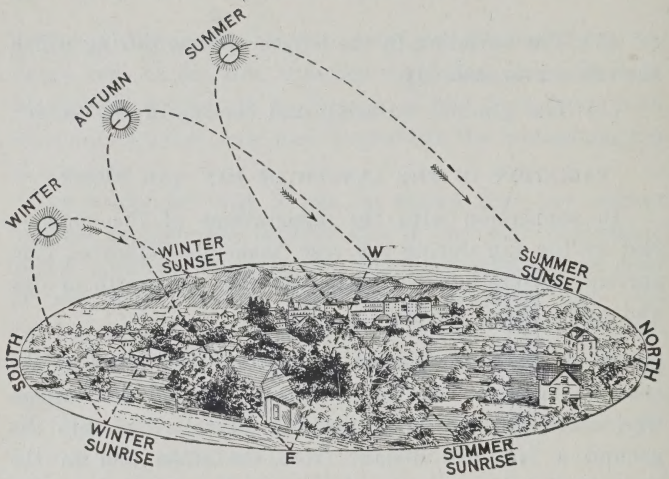
VARIATION IN THE LENGTH OF DAY AND NIGHT

In connection with the observations of the shadows cast by the sun during the year, make the following concurrent observations to determine why the length of day and night varies during the year:

On or about September 21st, at sunrise, stand at the shadow stake and observe the exact place on the horizon line where the sun first appears. Drive a peg into the ground a few feet distant from the stake and in the straight line between the stake and the rising sun. On the evening of the same day make a similar observation as to the setting sun. The noon-time position of the sun in the sky can be readily found (see page 71). The three principal positions of the sun in the sky are thus determined and permanently marked. Ask a pupil to stand at the stake and with arm extended trace with the forefinger the arc described by the sun in its apparent journey from sunrise to sunset.

Repeat the observations on or about December 21st, March 21st, and June 21st; and mark permanently the points of sunrise and sunset.

At the close of these observations, require the pupils in review to trace, as described above, the three arcs, namely, (*a*) the arc of June 21st, (*b*) the arc of September 21st and March 21st, and (*c*) the arc of December 21st. This should present no difficulty, as the sunrise, noon, and sunset positions of the sun on these dates have been permanently marked by means of the pegs.



POSITION OF THE MIDDAY SUN

If these instructions are carefully carried out, the following facts should become quite intelligible to the class :

(*a*) That, on or about June 21st, sunrise and sunset take place farthest north, that therefore the arc marking the pathway of the sun across the sky is longer, and hence that there are more hours of direct sunlight and consequently longer days and shorter nights, than at any other time of the year.

(*b*) That, on or about December 21st, sunrise and sunset take place farther south, that therefore the arc marking the pathway of the sun across the sky is shorter, and hence that there are fewer hours of direct sunlight and consequently shorter days and longer nights, than at any other time of the year.

(*c*) That, on or about September 21st, the points on the horizon line where the sun rises and sets correspond with those of March 21st and are intermediate between

those of June 21st and December 21st, and that on these dates the sun shines twelve hours, thus making day and night equal.

NOTE.—In the above observations the best results will be obtained where the surface of the surrounding country is more or less level. If so desired, the sunrise and sunset points on the horizon line may be marked by trees, buildings, or other objects in the distance. The explanation of the variation in the length of the arcs traced by the sun's apparent movement across the sky will be taught in the Junior Grade of Form IV.

THE EARTH AS A GLOBE

Its shape: Many years ago people believed that the earth was flat. What led them into this belief? What shape does the earth appear to have? Why does it appear to be flat? It is because we see but a very small part of it at a time. Place a piece of paper with a small hole in it upon an apple. You will observe that the small part of the surface of the apple seen through the hole appears to be flat although we know that the apple is round. What is the reason of this? What application has this to the earth and its shape?

What proof have we that the earth is round? Perhaps the most convincing proof to us is that people have journeyed around the earth. They have started from home and by going eastward for many days found that they finally reached home again coming from the west, and vice versa. You may go around a block in a town or township and come back to the starting-place, but to do so you will require to change your direction several times. In journeying around the earth, however, people keep the same general direction and get back to their

starting-place. Take a ball or an apple and show how this may be done.

Show, by holding an object in front of a lighted lamp, that the shadow cast by the object is determined by its own shape. During an eclipse of the moon, watch the shadow that slowly creeps over its face. What shape has the edge of this shadow? It is the earth's shadow that you see on the face of the moon. (See diagram, page 10, Text-book.) Then what shape must the earth have? If we lived on the moon, the earth would be seen by us at nights as a very large moon.

Because the earth is a ball-like body or sphere, it is called a *globe*. Here is a small one that is kept in the school to show you just what shape the earth has.

Size: How large do you think the earth is? Measure an apple through its centre from one side to the other side. This is called its diameter. If it were possible for us to measure the diameter of the earth in a similar way, we should find it to be about 8,000 miles long. How many days would you require to travel this distance if your railway train covered 400 miles a day? The distance around the earth (its circumference) is about 25,000 miles. The earth is larger than the moon but much smaller than the sun.

Surface: Of what substance is the surface of the earth composed? It is composed of land and water. What do we mean by the term "land"? By this term we really mean *rock*. In what different forms is this rock found? It is found either as solid rock or as soil. The latter is simply rock that has been worn down to extremely fine pieces. There is about three times more water surface on the earth than there is land surface. The land is not evenly distributed over the face of the earth, but is found

in great masses. What are these great masses of land called? What are the great divisions of water called?

On the globe at first and afterwards on wall maps, learn the names and relative positions of these continents and oceans.

THE TOWNSHIP

Rural Ontario has been surveyed into units called *townships.* These are usually separated from one another by roads called *town-lines* or *boundary roads.* Each township is further surveyed into *concessions* and *lots.* A concession is usually a strip of land extending from one end of the township to the other and is subdivided so as to form a row or tier of lots, each of these lots having the same frontage and containing the same area.

The roads in the township run both lengthways and crossways. The former usually run alongside the concessions and are known as *concession roads* or *concession lines,* or simply *concessions.* It will thus be seen that the term "concession" may be used in two senses. What are they? At convenient intervals roads cross the township at right angles to the concession roads; these are called *side-roads.* These concession roads and side-roads usually divide the township into blocks containing about 1,000 acres each. In most of the older townships there is, in some cases, only one concession between adjoining concession roads, in other cases, there are two concessions between. In the former case the lots are, as a rule, larger in area.

Both the concessions and the lots are numbered—the former from the town-line running along one side, and the latter from the town-line running along one end, of the township. By this arrangement it is a simple matter to find, or to describe, the location of any farm in the township.

NOTE.—The teacher should familiarize himself with the method of survey in the particular township in which his school is situated. A plan of the township may be drawn on the black-board and the pupils drilled until they can locate any farm, school, church, etc., that may be named. A plan of the local section on a scale large enough to allow the names of the farmers to be written on their respective lots will greatly aid in the understanding of the township plan.

MAPS

To teach representation by maps, try the following. Begin with a drawing or plan of the teacher's desk or table. This may be done thus: Place the table so that two of its edges run north and south. Place a large sheet of paper on it. Mark the centre of the paper and the directions, *north, south, east, west.* Now place several simple objects on the paper. Drill on the directions of these objects from the centre and from one another. Next, remove the objects, one by one, and mark in each case the place where it stood, either by writing the name on the paper or by making a simple outline, or picture, of the object. Drill upon the direction of these pictures from one another. The pupils will, in this way, learn that the sheet of paper is really a plan of the table, and that such a plan is called a *map.*

Take the paper off the table and hang it on the north wall of the school-room. Continue the drill on the directions of this map. The pupils will soon learn that the top of the map represents the north; the bottom, the south; the right-hand side, the east; and the left-hand side, the west.

After these relations have become fixed in their minds,

require them to draw similar maps of their desks. They will readily see that it is impossible to draw all maps the full size of the objects. It is not advisable at this stage to trouble them with details of size and proportion. The important thing is that they learn what a map really is.

After drawing a plan, or map, of the desk, the pupils may attempt a map of the school-room. This should indicate the position of a few of the more prominent objects in the room, such as the stove, the teacher's desk, the door, etc. A map of the school grounds may be attempted next, followed later by maps of the section and of the township.

It is advisable that these maps should be hung at first upon the north wall. After the different positions and directions have been drilled upon, the maps may be hung upon the other walls.

Be sure that the pupils understand the meaning of every mark or sign on the map. Every such mark, or sign, is like a word used in a sentence. Behind every word there must be an idea; otherwise the sentence cannot express thought. Marks, or signs, on the map, like words in a sentence, are of no use unless they help to relate ideas.

CHAPTER VIII

FORM III, JUNIOR GRADE

DETAILS OF THE COURSE

RECOMMENDATIONS TO TEACHERS

IN DEALING with the geography of a continent (or other large unit), impress upon the class that they are, *at the same time,* dealing with the larger features pertaining to the individual countries (or smaller units) comprising the continent (or large unit). For example: In dealing with the geography of North America, the pupils should consciously know that they are becoming familiar with many of the general features of Canada; and, vice versa, that, when the more detailed study of Canada is taken, they should consciously know that they are enlarging their knowledge of North America. The treatment of the larger and smaller units, therefore, should be so interrelated that their continuity and unity will become impressed upon the pupils. This principle should be carefully followed throughout this and the succeeding Grades. By so doing the very common error of considering such topics as isolated units of study will be avoided.

SUPPLEMENTARY READING

The Story of the Earth and Its Peoples:

Since this book has been specially recommended by the Minister of Education as a Reader in Geography for Form III and as a supplementary Reader in Form IV, trustees should see that a sufficient number of copies are

placed in the school library for the use of the pupils of these Grades. (See sec. 3 and 3 (1) of Authorized Text-books, page 88, *Regulations and Courses of Study, 1915.*)

It is recommended:

1. That the Junior Grade of Form III read the subject-matter pertaining to North America.
2. That the Senior Grade of Form III read the remainder of the book.
3. That the Form IV Grades re-read the book.

How to use the Reader:

1. In the Junior Grade of Form III and in both Grades of Form IV, the recitation in class should be *followed* by the reading of the corresponding chapter in the Reader.
2. In the Senior Grade of Form III, the subject-matter assigned for supplementary reading is outside that prescribed by the Course of Study for this Grade. The teacher, in this case, should prepare his pupils by means of a preliminary class "talk"—just sufficient to whet their interest, so that they may read with more appreciation and profit.

In addition to *The Story of the Earth and Its Peoples,* the school library should be well stocked with books of travel, etc., and these should be freely drawn upon for supplementary reading. Better educational results are likely to be obtained by striving to inculcate a taste for good reading while the pupils are still at school—a taste that can be further gratified after school days are over—than by requiring an undue amount of memorization of text-book matter.

Encourage pupils to bring in books and magazine articles. Encourage the making of scrap-books for preserving cuttings, pictures, statistics, etc., that may be useful in the geography class. Let pupils read much from all available sources, without holding them responsible in recitation for all that they read. Encourage the reading habit but direct it. Do not make the work too formal. Occasionally assign articles or chapters to be read at home by a pupil, to be afterward presented to the class.

THE EARTH AS A WHOLE

The earth as a whole (general notions only): Its form, apparent and real; axis; poles, relation to North Star; rotation on axis, day and night; equator, relation to the poles, recognition on globe and map; a general knowledge of the warm equatorial regions, the cold polar wastes, and the intermediate regions of moderate temperatures—with their low and high suns, and their main differences of climate and products.

See Geography Reader: *The Story of the Earth and Its Peoples*—"As Others See Us", page 7.

For hints on the teaching of the following topics, see Chapter IX: The axis of the earth; the poles; the equator; the earth's rotation; hot, temperate, and cold regions.

CONTINENTS AND OCEANS

The location of the continents, with their chief countries and islands; and of the oceans, with their chief seas, gulfs, and bays.

Fix names, locations, and relative sizes of the continents and oceans.

Connect them with stories and pictures of human life already more or less familiar. A few characteristic facts

should be connected with each, for example, Asia as the home of the Chinese and Japanese; the largest continent; the home of the Jews in Bible times; people less developed than here; etc.

Deal with the chief countries, islands, seas, gulfs, and bays in a similar way, for example, China as noted for its great population, tea, etc.; Argentina, for cattle, hides, wheat; Hawaiian Islands, for their location in mid-Pacific, for their sugar and rice; Egypt for the flooded Nile, pyramids, caravans, etc.

Take imaginary journeys to add variety and interest.

As a result of this study, the children are expected to have a *general, but well organized,* knowledge and clearer pictures of life and its typical customs, and of the products, physical phenomena, climate, etc., of the world at large.

See Geography Reader: "Land and Water", page 15; "The Sea-shore", page 17; "The Atlantic Ferry", page 25; "The Harvest of the Sea", page 31.

NORTH AMERICA

1. Location:
   (*a*) With reference to other continents
   (*b*) With reference to the oceans
   (*c*) With reference to hot and cold regions.
2. Shape and size in comparison with other continents.
3. Countries: Canada, United States and Alaska, Mexico, Central American Republics.
4. Surface Features:
   (*a*) Highlands and lowlands
   (*b*) Coasts
   (*c*) Drainage systems.

5. Climate:

   Temperature, moisture, winds. How influenced by location, shape, and size of the continent, and by surface features.

6. Natural Resources:

   (*a*) Vegetable
   (*b*) Animal
   (*c*) Mineral.
   How dependent upon conditions outlined above.

7. Industries:

   (*a*) Hunting and fishing
   (*b*) Grazing and stock-raising
   (*c*) Lumbering
   (*d*) Agriculture
   (*e*) Mining
   (*f*) Manufacturing.

8. Transportation and Commerce:

   (*a*) Internal trade, with routes
   (*b*) External trade, with routes
   (*c*) Commercial centres with reasons for location and growth.

9. People:

   (*a*) Native inhabitants
   (*b*) History of settlement. How influenced by physical environment.

Some such outline as the above should always be in the mind of the teacher, but it need not always be followed with exactness, since there may be danger of the form of the lessons becoming stereotyped. As an example of such variation it may seem the natural thing to consider the effect of each land form upon the climate, in-

stead of waiting until all the surface features have been discussed before taking up the climate.

See Geography Reader: "A River in the Ocean", page 29; "The Kuro Shiwo", page 35; "The North-West Passage", page 43; "In the Antarctic", page 47; "America—Surface and Climate", page 52.

For hints on teaching North America, see Chapter IX.

CANADA AS A WHOLE

1. Location:

   Surrounding land and water conditions—cold and temperate regions.

2. Extent:

   Its extent as conceived in terms of miles and of days' journeys. Comparisons with the United States and Europe. Provinces: Names, relative positions, capitals.

3. Relief:

   (1) In general: Highlands, watersheds, slopes (Pacific, Arctic and Hudson Bay, Atlantic).

   (2) In more detail: (*a*) Acadian Region, (*b*) Lowlands of the St. Lawrence Valley, (*c*) Laurentian Highland, (*d*) The Great Central Plain, and (*e*) The Great Mountain Area.

See *Ontario School Geography*, pages 86-92. For convenience, this Geography is referred to in this Manual as the "Text-book".

4. Drainage:

   The chief rivers, particularly the St. Lawrence, Saskatchewan-Nelson, and the Mackenzie Rivers, including their largest branches—their size, direction, and importance as highways for navigation; their

rapids and falls, advantages and disadvantages; fertility of their basins, cause and extent; their lake expansions (Ontario, Erie, Huron, Superior, Winnipeg, Athabaska, Great Slave, Great Bear). Canals ("Soo", Welland, and St. Lawrence).

5. Climate:

Apply the chief factors affecting climate (latitude, elevation, nature of soil, proximity to oceans or mountains, rainfall, local circumstances) to conditions in Canada. Characteristic climatic conditions in each Province.

6. Soil:

Fertile, barren or rock, cold or desert regions.

7. Occupations:

Natural conditions that determine the occupations of the people. Keep in mind the physical divisions of Canada and their characteristics. Consider particularly the extensive lumbering, hunting, fishing, agricultural, mining, and manufacturing operations, carried on in different sections of the country. Determine what is done with the products of these industries. Study the important trade channels (waterways, trunk railways, ports, ocean routes), and discuss the importance of Canada's trade with (*a*) Great Britain, (*b*) the United States, (*c*) other countries.

8. People:

The people of Canada, the races represented, the languages spoken, immigration, (whence, why, how employed, training for citizenship).

9. Government:

Federal, provincial; relation to Great Britain.

See Geography Reader, pages 58-172:

"The Surface of Canada", "The Oldest British Colony", "New Scotland", "New Brunswick", "Prince Edward Island", "Quebec", "Manitoba", "Saskatchewan", "Alberta", "British Columbia", "North-West Territories".

ONTARIO

1. Position
2. Area:
   407,262 square miles; how many times larger is its area than that of the British Isles, France, or Germany?
3. Surface Features:
   (1) Southern (Old) Ontario
   (2) Northern (New) Ontario.
4. Drainage:
   (1) Into St. Lawrence Basin
   (2) Into Winnipeg Basin
   (3) Into Hudson Bay Basin.
   Trace the "heights of land".
5. Climate:
   Temperatures, moisture, winds.
6. Resources:
   (1) Soil
   (2) Forests
   (3) Mines
   (4) Water-ways and water-powers.
7. Industries:
   (1) Agriculture:
      (*a*) Grain-growing
      (*b*) Dairying
      (*c*) Stock-raising
      (*d*) Fruit-growing.

(2) Mining:
Iron, copper, nickel, silver, gold, salt, oil, gas.
(3) Lumbering
(4) Fisheries
(5) Hunting and trapping
(6) Manufacturing:
Iron and steel, machinery, electrical apparatus, heating apparatus, agricultural implements, carriages and automobiles, paper, furniture, pianos and organs, flour and meal, woollens and cottons, meat-packing, canning, etc.

8. Transportation:
Railways, lakes and rivers, canals.
9. People:
Nationalities represented, where settled.
10. Cities and chief towns:
Location and principal industries.
11. Government:
Legislative, municipal, educational.

As the newspapers frequently refer to the counties of Ontario in connection with parliamentary representation, the administration of justice, and in other ways, it is desirable that pupils should familiarize themselves with the counties, county towns, and districts of the Province.

NOTE.—For a suggestive method of teaching Ontario, see Lesson on Nova Scotia, page 125. A recent map, showing the Province as a whole, is essential to good teaching. Maps showing New Ontario in a corner, and drawn to a smaller scale, are misleading.

See Geography Reader: "Ontario"—Sections I to IV, page 96; "The United States", page 183; "Mexico", page 211; "Central America", page 215; "The West Indies", page 218.

CHAPTER IX

FORM III, JUNIOR GRADE

SUGGESTIONS FOR LESSONS

THE EARTH AS A WHOLE

ITS AXIS

THE earth is continuously turning around. Illustrate this by means of an apple or an orange, and a hat-pin or a knitting-needle. When the orange turns on the needle, the latter may be called its axis. Why is it so called? Similarly the turning earth may be said to have an axis. Of course there is no large needle or anything of the kind on which the earth turns. We imagine, however, that there is a line on which it turns, and this imaginary line is called the *axis of the earth.*

THE POLES

The ends of this imaginary line are called *poles.* The earth, therefore, is said to have two poles—one at the north, called the *North Pole,* and the other at the south, called the *South Pole.* Are these poles real or imaginary? If we were to go to the places where these poles are, what do you think we would see? There would be no mark or anything of that kind to indicate the spot that is called the pole. We would not be able to recognize it, but if we had a skilled navigator or astronomer with us with the proper instruments, he would be able to show us just where it is. The discoverer of the South Pole (Amundsen) made a heap of stones to mark its location.

Show, by means of the globe, that the North Pole is straight north, and that the South Pole is straight south, of every place on the earth.

THE EQUATOR

Draw a line around the globe half-way between the poles in such a position that every point on it is equidistant from the two poles. This line is a circle. If we imagine such a circle drawn around the earth, what name shall we give to it? How much of the earth is north of the equator? How much is south of the equator? If the whole earth is a sphere, what shall we call each of these halves? The half north of the equator is known as the *Northern Hemisphere.* What shall we call the half south of the equator? (See diagram, page 12, Text-book.) Examine the globe closely and tell which of these hemispheres contains the greater area of land surface. Which has the more water surface?

THE EARTH'S ROTATION

Did you ever sit at the window of a rapidly moving railway car and see the telegraph poles, fences, etc., apparently moving in an opposite direction to that in which you were travelling? It seemed as though you were not moving at all.

When you see the sun moving across the sky, is it really moving? Is the sun moving while the earth is stationary, or is the sun stationary while the earth is moving? The truth is that the earth is rapidly rotating, that is, it is turning on its axis and carrying us around with it. It is turning so smoothly and silently that we do not feel the motion at all. Just as the fences, trees, etc., seemed to be moving backward when we were on the

swiftly moving train, so the sun seems to be moving backward when we are being carried around on the swiftly rotating earth. Illustrate this by rotating an orange on a hat-pin before a lighted candle. Let the candle represent the sun and show how the sun *appears* to rise and set. For a long time people believed that it was the sun that moved and not the earth. In what direction does the sun appear to move across the sky? In what direction, then, does the earth actually rotate? Illustrate this again by means of the orange and candle.

How long does it take the earth to make one rotation? What name is given to this period of time? In what other sense is the term "day" sometimes used? If the earth is 25,000 miles in circumference, how many miles will a person at the equator travel every hour owing to the rotation of the earth?

By rotating a globe or an orange before a lighted candle, show how day and night are caused. What conditions of day and night would prevail if the earth did not rotate? What would probably be the effect upon plant and animal life if the same side of the earth were always turned toward the sun? What is the "circle of illumination"? On which side of this line is it always twilight?

HOT, TEMPERATE, AND COLD REGIONS

The sun's rays fall either vertically or slantingly upon the earth. What kind of rays, the vertical or slanting, gives the greater heat? Why? The more vertical the rays are, the greater the number of them that will fall upon a given area, and consequently the greater amount of heat will such an area receive. Explain this by means of a diagram on the black-board. What part of the earth receives the vertical rays of the sun during the year. That

part in the neighbourhood of the equator. The hottest part of the earth is a great belt extending around the earth for about 1500 miles on each side of the equator. Locate this region definitely on the map. What countries and groups of islands are in this hot region? What food products are imported from these places?

What kind of rays shines upon the region around the North Pole? As a result of this, what kind of climate has this region? How far south from the North Pole does this extremely cold climate extend? About 1,500 miles. Locate this cold region on the globe and show that a portion of Northern Canada extends into it. What race of people live there? Deal similarly with the south polar region.

Between the cold polar region in the north and the hot region to the south, there lies a broad belt about 3,000 miles wide extending around the earth. What kind of climate is this region likely to have? It is neither extremely hot nor extremely cold. Why? Canada and the United States and nearly the whole of Europe are in this temperate region. In a similar way locate the great temperate belt in the southern hemisphere.

NORTH AMERICA

An examination of the Course of Study will show that the geography of North America is definitely prescribed for three Grades, namely, the Junior Grade of Form III and the Junior and Senior Grades of Form IV. In addition to this prescription, the individual countries of North America are prescribed for study, in more or less detail, in both Grades of Forms III and IV.

This, therefore, should suggest to the teacher that the geography of North America for the Junior Grade of

Form III should be of an introductory character. General notions only of location, size, political divisions, surface, drainage, coast features, climate, natural resources, industries, commerce, and people, should be taught at this stage. In Section XXIV of the *Ontario School Geography*, the teacher will find subject-matter quite suitable for the work of this Grade.

The old method of teaching the physical geography of a continent required the pupils, after stating what its boundaries are, to name and tabulate its mountains, capes, rivers, bays, islands, peninsulas, etc. The usual procedure was for the pupils to point out their location on the wall map—at least the *names* were pointed out, and then a list of each was written on the black-board for memorization. So well was the memory drill done that, even after the lapse of thirty or forty years, many people are still able to recite the complete list. For instance, the capes on the east coast of North America are Farewell, Chidley, Charles, Race, Breton, Sable, Cod, May, Henry, Hatteras, Sable, Catoche, Gracias-a-Dios.

Such methods are not of much value in developing the mental powers; they overload the memory with matter that has little relation to the other faculties of the mind and is of little practical use in after life. This method fails to make *intelligent* learners and often develops a distaste for the subject.

LOCATION OF NORTH AMERICA

What oceans wash the shores of North America? What two continents are east of North America? What continent is west? What strait separates North America from Asia? How wide is Bering Strait? Thirty-six miles. What three continents inclose the Arctic Ocean?

How near does North America approach the equator? Where does the Tropic of Cancer cross the continent? The Arctic Circle?

SIZE OF NORTH AMERICA

What two continents are larger than North America? How many times larger is Asia? What three continents are smaller? How many Europes would make one North America? What continent is almost as large as North America? How long is North America from north to south? About 4300 miles. How wide is it from east to west? About 3000 miles. If you were to travel twenty-five miles an hour, how many days would it take you to cross Canada from the Atlantic to the Pacific?

COUNTRIES OF NORTH AMERICA

The countries of North America may be taught at this stage, as it will be necessary to refer to them frequently as the lesson proceeds. On an outline map of the continent, carefully drawn on the black-board by the teacher, locate Alaska, Canada, the United States, Mexico, and Central America, by marking the boundaries which separate them. Tint the countries lightly with crayons of different colours. Drill thoroughly. Then hang the wall map of North America beside it, and continue the drill on it until the positions of these countries are thoroughly learned.

It may prove helpful, at this point, to refer in greater detail to the use of maps. The method of gradually building up the black-board map as the lesson is being taught, followed by a review drill on it and on the wall map, should be generally followed in elementary geography lessons such as this. In the development of the lesson, the

conversational method interspersed with questions to draw out the pupils' ideas will prove effective.

At this stage, the teacher is strongly cautioned to be constantly upon the alert to assure himself that his pupils are forming mental images of the country itself. Their thoughts must not stop short at the map, but should penetrate the map, as it were, to the country lying beyond, and for the understanding of which the map may be regarded as a window through which they are looking out upon the country. (See Chap. III, page 12.) *The extent of their ability to do this will largely determine the measure of their success or failure in this subject.*

The black-board map should not be overloaded with names. One way of overcoming this difficulty is to write the names of the features being taught, at the margin, number them, and then write the corresponding numbers on the map being developed. In review drills these names should be blotted out or covered up. Teachers are advised to make a new black-board map for each new topic taught. For example, one map may be used for developing the physical features; another, for natural productions (see Text-book, pages 81 and 82); etc.

Good seat work exercises in elementary map work may be provided by placing in the hands of the pupils outline maps made by means of a copying pad; or by taking a map outline made of cardboard, laying it upon the blank page of an exercise book, and making a pencil line round its margin. Later, of course, pupils should outline their own maps by freehand. After the physical features have been thoroughly taught, *not before,* the pupils should give expression to what they have learned by modelling in sand or clay. (See Chap. III, page 22.)

SURFACE OF NORTH AMERICA

There are three great highland regions in North America. What are they? The teacher shows their location on the map. What is the general shape of the continent? Show that the three great masses of highlands were factors in determining its outline. Which of the three highlands best deserves the name "continental axis"? Why?

THE ROCKY MOUNTAIN HIGHLAND

Between what two points does this extend? Near what ocean is it? In what place is it narrowest? Where widest? In southern British Columbia it has a width of about 400 miles. What is the principal range of mountains forming this Highland? Locate it definitely on the map. Note that, where the Highland is widest, there are several parallel ranges between the main Rocky Mountain Range and the Pacific Coast. Note, too, that the chain of islands from Vancouver Island north to the end of the Aleutian Islands (see wall map) really forms the tops of a submerged range.

What is the highest mountain in North America? In what country is it? Look for it in Alaska. (See Reference Tables on page 273 of the Text-book.) How high is Mount McKinley? Calculate its height in miles. Find Mount St. Elias. Describe its location. What is the highest mountain in Canada? Locate it. What is the highest peak in the United States? In Mexico?

Which is the longer slope of the Rocky Mountain Highland? Which is the shorter? How can you tell? Why does this Highland form such a barrier to trade and travel? In what country is the Rocky Mountain barrier likely to be most felt? Why?

THE APPALACHIAN HIGHLAND

This Highland should be dealt with in a manner similar to that employed in the study of the Rocky Mountain Highland.

THE LAURENTIAN HIGHLAND

This Highland comprises more than half of the Dominion of Canada. Locate it on the map. The teacher will find its location in the Text-book on pages 77 and 78. Note that it surrounds Hudson and James Bays in the form of a horse-shoe open to the north. (See diagram on page 74 of the Text-book.) Its most characteristic feature is the innumerable lakes, large and small, with which it is covered. Its streams are very irregular and tortuous, flowing from lake to lake in almost every direction.

Pictures of mountains and mountain scenery will prove very helpful in aiding the pupils to get intelligent notions of these wonders of nature. A number of such pictures will be found in the Text-book and in *The Story of the Earth and Its Peoples.*

CONTINENTAL SLOPES AND PLAINS

The crests of these great Highlands, together with a low-lying *Drainage Divide* extending from the Appalachian Highland round the head of the Great Lakes to the Laurentian Height of Land (see map on page 72 of Text-book), are the natural boundaries that divide the surface of North America into its continental slopes and plains.

What are the two great slopes of the Rocky Mountain Highland? A short westerly slope toward the Pacific Ocean and a longer easterly one toward the interior of the continent. What are the Appalachian slopes? One eastward toward the Atlantic Ocean, and the other westward

toward the interior. What are the Laurentian slopes? Since the Laurentian Highland has the general shape of a horse-shoe open to the north, it has an inner-curving slope toward Hudson and James Bays, and an outer-curving slope chiefly to the south and west.

The union of the great easterly slope of the Rocky Mountain Highland with the westerly slopes of the Appalachian and Laurentian Highlands and the Drainage Divide to the west of the Great Lakes, forms the Great Central Plain. The union of the slopes of the Appalachian and Laurentian Highlands to the east of the Great Lakes Drainage Divide, forms the great St. Lawrence Basin.

DRAINAGE OF NORTH AMERICA

What are the physical divisions of the continent as outlined above? They are (*a*) the Pacific Slope, (*b*) the Atlantic Slope, (*c*) the Great Central Plain, (*d*) the Basin of the St. Lawrence, and (*e*) the Hudson Bay Basin. Locate these definitely on the map, and tell what their boundaries are. These natural divisions determine the character of the drainage systems of North America.

The Pacific Slope

Why are most of the rivers of the Pacific Slope comparatively short? Why are they swiftly flowing rivers? Why are many of them of little use for navigation? Name a few of the larger rivers. How would you account for the great length of the Yukon River? The Columbia River? How long are they? (See Text-book, page 273.) Why are there so few rivers south of the Canada-United States boundary flowing into the Pacific Ocean?

The Atlantic Slope

Why are the rivers that flow from the Appalachian Highland to the Atlantic comparatively short? Why are many of them navigable in the lower parts of their course but not in their upper stretches? One of these rivers is in Canada. Name it. What city is at its mouth? Name three American rivers flowing into the Atlantic, each of which has a very large city at or near its mouth. Name the cities. Why are large cities so often found at or near the mouths of rivers?

The Great Central Plain

This extensive Plain comprises three very large river basins. What are they? Locate on the map the divide between the Mackenzie Basin and the Winnipeg Basin. Note that it runs in a north-easterly direction from the vicinity of Mounts Brown and Hooker in the Rockies to the Nelson River. The Winnipeg Basin includes those of the Saskatchewan, Red, and Winnipeg Rivers.

The divide between the Winnipeg Basin and the Mississippi Basin, like that between the Mackenzie and Winnipeg Basins, is low (prairie); yet it is called a Height of Land. Trace, on the map on page 73 of the Textbook, its course from the Rocky Mountains to the Drainage Divide a short distance west of Lake Superior. Note that it follows roughly the international boundary line, but that it takes a dip to the south round the head-waters of the Red River. Repeat the tracing until you are thoroughly familiar with its location.

THE MACKENZIE BASIN

What three large lakes are in the Mackenzie Basin? What two large rivers flow into the western end of Lake Athabaska? What river drains Lake Athabaska into Great

Slave Lake? What river flows out of Great Slave Lake? In what direction does it flow? Locate its mouth. What meridian line (see page 70) crosses its mouth? Follow this meridian line south on the map, and show that the mouth of the Mackenzie River is really much farther west than Vancouver Island.

The Mackenzie River is icebound in winter. Why? In what part of the river will the ice break up first in spring? Why? If the ice breaks up and the river becomes flooded in the upper parts of its course while the lower part is still fast icebound, what is likely to be the result? Why?

It is said that the finest wheat in the world can be grown in the Peace River country—a part of the Mackenzie Basin. In this connection note that wheat can be successfully grown as far north-west of Winnipeg as Winnipeg is north-west of New York City. Read what you can about the great natural resources and wonderful possibilities of the Mackenzie Basin.

THE WINNIPEG BASIN

General subject-matter only should be taught at this stage. A more detailed treatment will follow in the Senior Grade of Form III.

THE MISSISSIPPI BASIN

General subject-matter only should be taught at this stage. A more detailed treatment will follow in the Senior Grade of Form IV.

THE ST. LAWRENCE BASIN

General subject-matter only should be taught at this stage. A more detailed treatment will follow in the Senior Grade of Form III.

Hudson Bay Basin

Consult the map and note that the rivers that have their source in the Laurentian Highland flow into the St. Lawrence River and Great Lakes from its southern slope, and into Hudson and James Bays from its northern slope. Is there a Hudson Bay Basin? Why do you think so? Try to trace on the map the divide ("height of land") that separates the Hudson Bay Basin from the St. Lawrence Basin on the south and from the Mackenzie Basin on the west. Repeat the tracing until you are quite familiar with the general trend of this so-called "height of land".

If a basin includes the whole area drained into a common outlet, then the Winnipeg Basin should be included as part of the Hudson Bay Basin. Why? For teaching purposes, however, it will be better to teach the former first as a basin by itself. With the exception of the Nelson River, the names of the others flowing into Hudson and James Bays may be reserved for the Senior Grade, Form III, when Canada will be studied in greater detail.

SHORE FORMS OF NORTH AMERICA

The Canada-United States international boundary line divides the North American Continent into almost equal parts. Verify this statement by consulting the Reference Tables in the Text-book. In what respect does the coast-line of the northern half of the continent differ greatly from that of the southern half? The former is much broken; the latter is comparatively unbroken. What do these terms mean?

In regard to the shore forms of North America, the map should be made the essential basis alike for the teacher in his teaching and for the pupils in their preparation. The method of prescribing a list of names to be

memorized is, as has already been pointed out (page 95), not a good one.

A better method would be to select a definite part, or unit, of the coast for study, and with the map before the class, require them to make close observations of its various shore forms. The capes, bays, river mouths, etc., are carefully traced in due order. Every pupil thus becomes, as it were, a geographical explorer, noting for himself the physical features of the area selected for study and fixing them upon his memory as they appear on the map.

The teacher should aim at conducting the recitation in a bright, informal, and conversational manner—questioning from the pupils all that they may be expected to know from their own observations or reflection, and incidentally calling their attention to details with which they are not familiar but which will add interest and vividness to the subject. Instead of seeking to fix a form, name, or idea, in the memory in its isolation, aim rather at associating it with others, in the hope that the associated group will aid in the memorizing of its parts.

As an illustration, take those shore forms associated with the Gulf of St. Lawrence: Locate the Gulf of St. Lawrence on the map. Who discovered this Gulf? Tell the story of its discovery. How did it get its name? Read Thomas D'Arcy McGee's poem, *Jacques Cartier,* to the class. What large river flows into the Gulf? Note its wide mouth. What island is at its mouth? What great lakes are drained by the St. Lawrence River? What two large islands are at the entrance of the Gulf? What strait separates Newfoundland from Labrador? When sailing out of the Gulf through the Strait of Belle Isle, what cape is on the left? What general shape has Newfoundland? What capes form its three corners? Locate the "Banks

of Newfoundland". What are they? For what are they famous? How are cod and lobsters caught and prepared for market? What large island forms part of the Province of Nova Scotia? What strait separates it from the mainland? Locate Cape Breton on this island. What separates Cape Breton Island from Newfoundland? Cabot Strait. What Island Province lies in the southern part of the Gulf? What strait separates it from the mainland? Why are the shores of the Gulf of St. Lawrence so inaccessible during the winter months? Etc.

Show pictures of this part of North America with its fisheries, icebergs, etc., to help in developing interest. Drill thoroughly.

Deal in a similar way with other coast units. Only the more important shore forms should be taught in the Junior Grade of Form III.

CLIMATE OF NORTH AMERICA

The teaching of this topic should present no special difficulty provided the following general principles are carefully observed:

1. Only "continental" notions of climate should be considered, as the detailed geography of Canada, the United States, etc., will follow at a later stage.

2. The question method should be followed throughout.

3. Insist upon the map being freely used as the subject is being developed.

The main factors that determine climate are: (1) temperature, (2) moisture, (3) winds. And these factors are affected by, (*a*) distance from the equator, (*b*) elevation above the sea-level, (*c*) distance from the sea, (*d*) direc-

tion of the mountain ranges, (*e*) character and direction of ocean currents, and (*f*) other less important causes.

Apply these factors to the North American Continent chiefly by questioning the class before the map.

Let the class remember that North America extends through every possible variety of climate, from that of tropical Panama to that of Arctic Greenland. Generally speaking, we may say that it is extremely hot in the far south and extremely cold in the far north. Local conditions, however, must be taken into account when estimating what the climate of any particular region is.

Note that the land rapidly absorbs heat in summer and rapidly radiates away heat in winter; that the ocean slowly absorbs heat in summer and slowly radiates away heat in winter. That is, water is both heated and cooled much more slowly than land. Hence, the interior of the continent is much hotter in summer and much colder in winter than corresponding places at the sea-shore that are the same distance from the equator.

What rivers, seas, lakes, etc., are likely to be icebound during the winter? In the far north and on the Island of Greenland, winter is very severe and lasts most of the year. What people live in these cold regions? How are the Eskimos able to keep themselves from freezing?

In what regions of North America is the rainfall heaviest? At this point let the teacher sketch on the black-board a rainfall map of North America. Use different-coloured crayons to indicate the regions of heavy, medium, and light rainfall. Locate the two regions of least rainfall (desert conditions). Consult the rainfall map of the world on page 40 of the Text-book. Require the pupils for seat work to make a similar map of North America as a review test.

Remember that rainfall is dependent upon winds. A brief consideration, therefore, of the principal winds of North America at this stage should help the pupils to understand the continental rainfall better. In this connection consider briefly the Prevailing Westerlies from the Pacific Ocean, the more variable winds from the Atlantic Ocean and the Gulf of Mexico, and the Trade-winds in the South. The Atlantic coast, especially from Newfoundland to Cape Cod, has quite a heavy rainfall and much fog. Speaking generally, the rainfall is heaviest on the Pacific and Atlantic coasts and diminishes toward the interior of the continent.

The Course of Study reserves a more detailed consideration of these winds for the Senior Grade of Form IV.

NATURAL RESOURCES OF NORTH AMERICA

The chief natural resources of North America may be summarized as follows:

1. Vegetation, which is dependent upon temperature, rainfall, and character of soil.
2. Animals, which are dependent upon vegetation.
3. Minerals.

VEGETATION

North America has such an enormous area and such a great variety of climate that its vegetation varies greatly. Why is vegetation lacking in the regions of unbroken snow and ice? South of this is an immense region called Tundra, growing mosses, shrubs, and stunted trees. Why cannot trees grow there? The soil is always frozen, except at the very surface, which thaws out for a few brief weeks in summer. Trees such as we have here cannot grow because their roots cannot penetrate the frozen subsoil in order to get nourishment. The brief summer, however, is

warm enough to enable some grasses and small-flowering plants to grow rapidly. Some of these plants produce berries which, after ripening, are preserved in the snow, and thus are available as food for the birds when they arrive in the spring.

Show that on the southern edge of the Tundra region forests begin to appear, at first scanty and with stunted trees; but that further south they are composed of magnificent forests of pines, spruce, and other conifers. What is pulpwood? From what trees is it obtained?

Draw from the class that wherever it is warm enough and wet enough they may expect to find forests. Refer to the maps showing the rainfall and note where the wet regions are. These are the districts where the forests are to be found. The kind of trees found in these forests varies with the latitude (distance north of the equator). What kind of trees grow in the more temperate regions? Here are found "mixed woods". Name some of the "hard woods" of the temperate regions. Tropical forests contain ebony, mahogany, logwood, rose-wood, etc.; these are called cabinet woods or dye woods, according to the use that is made of them. Shade or colour the forest areas of North America on a black-board map; then cover the map and require the pupils, for seat work, to draw similar maps on paper; uncover the black-board map and compare results. (Consult map on page 51 of the Text-book.)

The grass lands are the next most extensive areas of natural vegetation. Grass flourishes well in regions that are subject to extremes of climate, for it grows quickly, and a short, hot summer will bring it to maturity. Why is there little grass in forest regions? Why are there few trees where there is much grass? For the purpose of showing the location of the grass lands you may, therefore,

use the forest map which you have just made. In many areas there is not sufficient rain for forest growth, but there is sufficient for the growth of grass (see map, page 82, Text-book). In Mexico and Central America there are no extensive areas of grass lands, except on the higher plateaus. In areas of little or no rainfall, desert conditions prevail. Mark these districts also on your map.

Make another blank map of North America showing the boundaries of the countries and insert the names of the following plants in the districts where they are grown: Wheat, corn, oats, barley, rice, sugar-cane, cotton, tobacco, hardy fruits (apples, etc.), tropical fruits (bananas, oranges, pineapples, spices, etc.). (Consult map on page 81 of the Text-book.)

ANIMALS

Why does the north produce the best fur-bearing animals? What is the most important fur-bearing animal? Fur-bearing seals are found on the Pribylof Islands and on the coasts of Alaska. There are seal fisheries off the coasts of Newfoundland and Labrador, but the seals are taken for their oil and skins, and their fur is of no value. What other animals are found in the northern seas that are of commercial value?

Sheep, cattle, and other domestic animals have been introduced into most parts of the continent. Note that sheep feed on the dry plains and hillsides, while cattle are found in the lower, richer, and warmer areas. Why? What conditions necessary to successful stock-raising are found in the Great Central Plain? The climate is suitable, grass and water are abundant, land is fairly cheap, and transportation is easy.

The food fishes found in the coast waters of the northern half of North America are of great value. What

are the principal food fishes found in these waters? What natural conditions exist in northern waters favourable to the production of fish? (See Text-book, page 94.)

MINERALS

North America is rich in minerals. In what kind of districts are minerals usually found? Why are they found in hilly or mountainous districts and not in flat, alluvial plains?

Use blank maps again. Shade the areas where coal is found. Locate, by writing their names on the map, the areas where iron, gold, silver, copper, mineral oil, and gas are found. Why are districts where coal and iron are found in close proximity likely to become important centres of industry? Name and locate such a centre. The deposits of nickel in Ontario are the richest in the world. Why is coal found extensively underlying the Great Central Plain? Use a blank map to indicate where the above-named minerals are found. (See page 82 of the Text-book.)

Other resources that may be briefly considered are good harbours, useful lakes and rivers, and water-powers.

DISTRIBUTION OF POPULATION

Locate on the map the districts where the population is most sparse. Are these districts hot or cold, fertile or barren? In what regions is the population dense? Are these regions, on the whole, temperate or tropical? Are they grass lands, forest lands, or mineral areas? Does excessive tropical vegetation encourage or hinder a large population? Why?

INDUSTRIES OF NORTH AMERICA

In Canada the Tundra region is called the "Barren Lands". What does this name indicate? The people who live there have not much choice of occupation. Why not? They cannot farm. Why not? How do they make their living?

What are the possible industries in a temperate forest area? What are the areas where the agricultural industries (grain-growing, cotton-raising, stock-raising, dairying, fruit-growing, etc.) are carried on? Question the class about the industries carried on in connection with the coast waters.

In order that manufactures may be successfully carried on, what conditions are necessary? There must be power available to drive machinery, good transportation facilities, a climate suitable for hard work, and food must be abundant and cheap. Locate the principal districts where manufactures are carried on and show to what extent the above facilities are available. What effect has the great European market upon the location of North American industries? How is the opening of the Panama Canal likely to affect the industries of Western America?

Do not consider special manufactures at this stage. They will be considered at a later stage, when the countries of North America are taken in detail.

TRANSPORTATION AND COMMERCE

Consider in a general way:

(1) Internal trade, with routes

(2) External trade, with routes

(3) Commercial centres, with reason for location and growth.

CHAPTER X

FORM III, SENIOR GRADE

DETAILS OF THE COURSE

SUN, MOON, STARS, ETC.

The Sun:

One of the stars; distance from earth; source of heat, light, and energy; attraction force; influence on life.

The Planets:

Names, motions, are stars shining with reflected light, "morning" and "evening" stars, the earth a star, recognition of the brighter planet-stars in the sky.

The Moon:

A cold, dead world; shines with reflected light, rotation around the earth, lunar month, time of rising, why later each night; phases, explanation.

Comets:

Nature, appearance.

Stars:

A few generalizations only: are other suns, source of light, different colours, cause of "twinkling", distance from earth, the "Milky Way", recognition of North Star, Big Dipper, Little Dipper, and a few other prominent stars and constellations.

Meteors:

Shooting stars—cause of light.

Geography Reader: "Coral Islands", page 37; "Monsoon Weather", page 49.

For hints on the teaching of the following topics, see "Suggestions for Lessons", Chapter XI: The Solar System, The Sun, The Planets, The Moon, The Stars, Comets, Meteors.

CANADA

1. Review Canada as a whole and Ontario in detail, as outlined for the Junior Grade of Form III.
2. The other Provinces in considerable detail, the Territories, Newfoundland. The lesson on Nova Scotia (see page 125) will suggest a method of treatment.
3. Consider, in the light of the detailed study of the individual Provinces, Canada as a Dominion, emphasizing particularly the commercial aspect of the subject.

In connection with the commercial geography of Canada, review briefly the home industries as outlined for Form II. Determine, if possible, how these industries happen to be located where they are. In what ways are they important to the home locality? Have they any importance to other parts of the country or to the world abroad? If so, show how and trace their products to places of consumption or distribution. Use maps for this purpose. Study lines of transportation. Why does not the home locality produce all things needed for consumption there? Show why different localities have different industries.

After an introductory study of home industries, consider further the great industries of the Dominion. The following list is suggested:

(1) Agricultural produce: fruits, grains, flour, meal.
(2) Animals and their products: bacon, cheese, cattle, hides and skins, furs.
(3) Fisheries' produce: salmon, codfish, etc.

(4) Forest products: lumber, square timber, pulpwood, wood-pulp.
(5) Mineral produce: coal, iron, gold, copper, silver, nickel, lead, asbestos.
(6) Manufactures: wood, iron, leather, etc.

In the study of each of these industries:
(1) Locate the region of production.
(2) Study carefully the natural physical features and the climate of the region.
(3) Picture the life of the people engaged in the industry.
(4) Trace the general steps in the production and preparation for market.
(5) Locate important centres of production, manufacture, and trade.
(6) Trace the movement of products to market, studying carefully the routes taken.
(7) Determine why products go to various markets.
(8) Compare, when possible, present methods of production and transportation with earlier methods. Seek causes for the differences.
(9) Consider the importance of the industry to our own country and to the world at large, both from the standpoint of money value and from its influence upon the happiness and comfort of the people.

These industries should be taken as types. Show how and why the Government, in some instances, is aiding the development of some of these industries, through irrigation, experimental stations, fish hatcheries, forestry, fish and game laws, etc.

All places mentioned in connection with the study of an industry, such as province, cities, prairies, lakes,

rivers, and canals, should be definitely located. Use pictures, picture post-cards, and materials to illustrate the subject-matter being studied.

THE PROVINCES OF THE DOMINION

Provinces:

1. Ontario
2. Quebec
3. New Brunswick
4. Nova Scotia
5. Prince Edward Island
6. Manitoba
7. Saskatchewan
8. Alberta
9. British Columbia.

Territories:

1. Yukon. 2. Mackenzie.

For hints on the teaching of a Province, see lesson on Nova Scotia, Chapter XI.

Newfoundland.

Newfoundland: See Geography Reader, pages 64-6.
South America: See Geography Reader, pages 224-64.
Asia: See Geography Reader, pages 350-414.

THE MOTHER-COUNTRY IN GENERAL

1. Countries included.
2. Size:
   Compare with areas in Canada.
3. Location:
   Direction from other European countries and from Canada.
4. Surface.

5. Climate:
   Rainfall
   Temperature: Compare with same latitude in North America; reasons for difference.
6. Occupations:
   (1) Agriculture and grazing:
      Need for agricultural products
      Crops raised
      Advantages for agriculture
      Importance of stock-raising
      Conditions favourable for grazing.
   (2) Fishing:
      Where carried on
      Why an important industry.
   (3) Mining:
      Location of principal coal-fields
      Where iron and tin are found
      Importance of mining industry
      Uses made of coal and iron.
   (4) Manufacturing:
      (*a*) Woollens:
         Leeds and Bradford the centres (Yorkshire)
         Kinds of woollen goods manufactured
         Advantages for manufacturing
         What becomes of manufactured goods.
      (*b*) Cottons:
         Manchester the centre (Lancashire)
         Advantages for manufacturing
         Where manufactured goods are sent.
      (*c*) Iron and steel:
         Glasgow, Sheffield, Birmingham, chief centres

Kinds of goods manufactured
Advantages of each centre
What becomes of manufactured goods.

(*d*) Linens:
Belfast the centre
Advantages for manufacturing
How linen is made
Where it is sent.

(*e*) Shipbuilding, potteries, carpets, etc., as time permits.

7. Commerce:

(1) Imports:
(*a*) Foods
(*b*) Raw materials.

(2) Exports:
Manufactured goods.

(3) Chief ports:
London, Liverpool, Southampton, Glasgow, Belfast, Bristol, Plymouth, Portsmouth, Hull, Newcastle. Locate each on map.

8. The people:
Nationalities
Characteristics
Government
Chief Overseas Dominions and colonies.

Europe: See Geography Reader, pages 265-348.
Africa: See Geography Reader, pages 439-509.

THE BRITISH EMPIRE

The Empire and its component parts. See the Text-book, pages 250-258.

See Geography Reader, "Australasia", etc., page 415; "The British Empire", page 510.

CHAPTER XI

FORM III, SENIOR GRADE

SUGGESTIONS FOR LESSONS

THE SOLAR SYSTEM

THE solar system, of which our earth forms a part, consists of (*a*) the *sun,* which is the centre of the system, (*b*) the *planets,* which revolve around the sun at various distances from it, (*c*) the *moons* of the planets, which revolve around them, and (*d*) the *comets,* which also revolve around the sun, but in a more irregular way than the planets do. Draw on the black-board a diagram of the solar system illustrating the above parts composing the system. (See diagram, *Ontario High School Physical Geography,* page 320.)

THE SUN

The sun is really one of the "fixed stars", but as it is so near to us, it looks very, very much larger than the other stars that are very much farther away. How far away is it? (See lesson on "The Sun", Chapter V.) The diameter of the sun is more than one hundred times greater than that of the earth. It is a great ball of intensely hot fire. Great "spots" are sometimes seen on the face of the sun; these seem to be great holes, sometimes with more than enough room for our earth to fall into. It is not thought to be a solid body like our earth; it is more likely to be a gaseous or liquid body. If it were not for the heat, light, and energy that we get from the sun, our earth would be a cold, dead world.

THE PLANETS

The planets in the solar system are eight in number. Their names, in the order of their nearness to the sun, are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. Mercury is the smallest of the planets—much smaller than the earth; Jupiter is the largest and is more than 1400 times as large as our earth. Mercury has the shortest orbit or pathway round the sun and takes 88 days only to make one revolution; the Earth requires 365¼ days. Neptune has the greatest orbit and requires 165 years to make one revolution about the sun. Hence, one year on Mercury is about one quarter as long as ours, while Neptune's year is 165 times longer. How many years old would you be if you lived on Mercury? If Neptune has four seasons in its year, as we have, how long does its winter last?

All the planets, except Mercury and Venus, have moons; the earth has one moon; Saturn is known to have nine. All the other planets look like stars when seen from the earth at night; and, if viewed from another planet, our Earth would also be a star. The planet-stars, however, are not true stars, but shine with light reflected from the sun. In this respect they are like our moon. The planet-stars have a quiet, steady, and not a twinkling, light. Mercury and Venus are often seen as the "evening star", the first star to appear after sunset; or as the "morning star", the last star seen shining before sunrise. Seek assistance in locating them.

THE MOON

The moon has no heat or light of its own and hence shines by light reflected from the sun.

Review the facts learned by observation in a previous class (see page 42), and tell the class that the changes

which take place in the appearance of the moon are called the *Phases of the Moon.* By means of a ball and a lighted candle, and also by diagrams on the black-board, establish the causes of these phases as follows:

(1) When the moon, on its journey round the earth, comes between the earth and the sun, the illuminated half of the moon is turned toward the sun and the dark half toward the earth. At this time there is "no moon".

(2) When the moon has passed a little to one side of a straight line joining the earth and the sun, we see the edge of the moon lighted up by the sun. This is called the *New Moon.*

(3) When the moon has moved on to a point where the straight line joining the earth and the moon is at right angles to that joining the earth and sun, we see one half of the moon's face lighted up. This phase is called its *First Quarter.* Why so called?

(4) When the earth is between the sun and moon, we see the whole face of the moon lighted up by the sun. This is the *Full Moon* phase.

(5) When the moon has moved round the earth to a point opposite to that of the First Quarter, it is again in a position where only one half of its face is lighted up. This phase is known as the *Third Quarter* or *Last Quarter.* Why so called? (See diagram, page 324, *Ontario High School Physical Geography.*)

Note that the new moon crescent is the lighted edge of one side of the moon, while the old moon crescent is the lighted edge of the opposite side. On which side of the lighted edge is the sun in each case? Note the same phenomena at the times of First and Last Quarters.

It takes about 29½ days for the moon to journey round the earth once. What name is given to this interval of

time? How many lunar months are there in one year? Does the moon turn on its axis as the earth does? What proof have you of this? We know that the moon always presents the same face to the earth, because the same markings ("man in the moon") are always seen on its face; these dark markings are probably shadows cast by mountains. If a pupil walks round a chair by keeping his face toward it, show that he himself has actually made one complete turn. Apply this to the case of the moon and show that it must turn on its axis once every lunar month.

The moon is approximately 50 minutes later each night. What is the cause of this? If the moon were stationary, it would rise always at the same time. As it is moving in the same direction in which the earth is rotating, and as it makes a complete revolution round the earth in about $29\frac{1}{2}$ days, therefore it must make $\frac{1}{29\frac{1}{2}}$ or $\frac{2}{59}$ of its round in a day. Hence, the interval of time between two successive risings of the moon must be the time required by the earth to make $1\frac{2}{59}$ turns, that is, approximately 24 hours and 50 minutes.

The moon is a cold, dead world and probably contains no atmosphere, no water, and no life. Its surface is barren rock. Meteors must batter the moon freely, as there is no atmosphere to burn them up as they fall. The moon is a silent world, as there is no air to vibrate to produce sounds.

THE STARS

If we look above us on any clear day or night, we see what appears to be a great blue vault, or dome, which we call the sky. What is the name of the circular line where the earth and sky appear to meet? At night the sky is literally filled with bright objects called stars.

Although the stars are so very far away, many interesting things have been learned about them. Astronomers tell us that every shining star is in reality a great blazing sun, and that many of them are supposed to have other worlds spinning around them, just as the earth on which we live spins around our sun. These worlds are, however, too far away for us to see them even with the aid of telescopes. How many of such worlds there are, how large they are, what kind of people (if any) live on them, we have no means of knowing. It is a wonderful thought, is it not?

Astronomers are able to measure the distance between us and many of the stars. All of them are very, very far away. We know that light travels very fast—186,400 miles a second. At this rate it takes the light of the sun eight minutes to reach the earth. The nearest star is so far away that a ray of light from it takes about four years to reach us. If this star were suddenly to become extinguished, we would still continue to see its light for four years longer. Look for the Pole Star; it takes nearly half a century for its light to reach us. Find the Pleiades group of stars; these are so far away that the light we see shining from them has been on the way for more than four hundred years. Indeed, other stars are so far away that it takes thousands of years for their light to reach us.

If you watch the stars at night, you will be able to observe that, like the sun and the moon, they are apparently moving. In what direction do they seem to move? They are not really moving from east to west across the sky; they are stationary in the same sense that the sun is. Why then do they seem to us to move across the sky?

The stars are of different ages. Like us, they are gradually getting older. Some stars are shining with

white or blue light; these are the younger stars. As they grow older they become yellow, like our sun; and when they get still older, they turn red in colour. Many stars finally lose their heat and light and become cold and dark. Of course, when they reach this condition we cannot see them any longer. Observe the stars on some clear night to see if you can find stars of different colours—white, blue, yellow, red. All true stars "twinkle". Why? If there was no atmosphere, the stars would not twinkle.

You should be able to locate in the sky a few of the more important stars and constellations. Find the *Milky Way*; it is a great white band across the sky. It is made up of so many stars, and they are so far away that we cannot see them distinctly; we see their diffused light. It is this diffused light that gives the Milky Way its peculiar appearance.

Locate the North or Pole Star; it is almost stationary, and for this reason makes a good "guide star". There are other stars in the northern sky that never set; they seem to revolve round the Pole Star without getting below the horizon. The following constellations may be observed in this connection: The Great Bear (or the Big Dipper), the Little Bear (or the Little Dipper), the Dragon, and Cassiopeia's Chair. The relation of the "Big Dipper" to the Pole Star is shown in the diagram on page 12 of the Text-book.

The principal stars in the winter sky are Orion, Sirius (the Great Dog Star, the most beautiful star in the winter sky), the Pleiades, Castor and Pollux (the Twin Stars), etc. In the summer sky will be found Regulus, Arcturus, the Northern Crown, Vega (the brightest summer star), Antares, the Northern Cross, Altair, etc. It is toward Vega that our sun and its attendant planets, including the

earth, are moving at the approximate rate of 800 miles a minute. Do not rest satisfied until you can identify the above-named stars. (Read Chapter XIX, *Ontario High School Physical Geography.*)

COMETS

Comets are probably white-hot masses of gas, which move swiftly toward the sun, go round it, and then rush away again. They are usually recognized by a tail of light. A large comet is quite beautiful, with its bright head and long flaring tail. The tail is always on the side away from the sun, and sometimes it is longer than the distance between here and the sun. The name *comet* is derived from an old word that meant "long-haired". Why was this name given to it? (Consult the *Ontario High School Physical Geography,* page 332.)

METEORS

Floating through space beyond the earth's atmosphere are bodies which, it is supposed, were once heated and luminous; but, having lost their heat and light, are now cold, dark, rock-like masses. When they happen to come near enough to the earth to be influenced by gravitation, their great speed carries them so swiftly through the atmosphere that the friction developed heats them until they glow and burn. As the blazing mass rushes through the upper air, it looks like a streak of light. It is this streak of light that is called a *meteor* or "shooting star". By waving rapidly back and forth a stick of wood with a glowing end a very good representation of a shooting star may be obtained.

Usually these meteors burn up before they reach the surface of the earth; occasionally, however, the residue of

a very large one may strike the earth and bury itself in the soil. When such a one is found, it looks like a dark mass of stone; it is then called a *meteorite.* Meteorites, when found, are regarded as curiosities and are often placed in museums. (See the *Ontario High School Physical Geography,* page 333.)

NOVA SCOTIA

This lesson is intended to suggest principles that may be used with advantage in the teaching of any particular province or country. Nova Scotia is chosen in preference to Ontario as it is a much smaller and simpler unit, and the method illustrated is not so likely to be obscured by the use of a greater mass of details.

The teacher will observe that the subject-matter of this lesson is dealt with under certain topics arranged in a certain order, as follows: 1. Location; 2. Size; 3. Physical features (surface, coasts, drainage, soil); 4. Climate; 5. Natural resources; 6. Industries; 7. Transportation; 8. Trade and Commerce, exports and imports; 9. People and Government; 10. Cities and chief towns.

A little consideration will show the advantage to be gained by teaching the topics in the order indicated.

1. The location of a country with reference to its latitude, together with its land and water features, drainage, etc., provides most of the data for estimating the character of the climate.

2. The physical features (surface, soil, drainage), together with the climate, determine in large measure the natural resources.

3. Similarly, physical features, climate, and natural resources form the basis for transportation, trade and commerce, exports and imports, and growth of cities and

towns; the fact should be emphasized that physical causes largely determine the life and occupations of a people.

Hence, it would be illogical to teach climate before location and physical features; natural resources before climate; industries before natural resources; trade and commerce before natural resources and industries, etc. By observing such principles as these in the teaching of geography, the teacher is training the pupil to associate causes with their consequences and consequences with their causes. By so doing, he not only arouses a greater interest in the subject, but lightens the burden on the pupil's memory by appealing to his reasoning and reflective powers.

Before beginning the lesson, the teacher is recommended to make an outline map of Nova Scotia on the black-board, to be filled in as the lesson is being developed, and also to hang the wall map before the class for constant reference. Unless a good black-board outline can be made it may be dispensed with and only the wall map used; a poorly-made black-board map may, for obvious reasons, prove worse than none at all.

1. LOCATION

What direction is Nova Scotia from New Brunswick? What three bodies of water wash its shores? What is the latitude of its most southerly point? Compare this with the latitude of Toronto. What is the latitude of its most northerly point? Compare this with the latitude of Quebec City. What country in Western Europe is in the same latitude? What is the most southerly point in Canada? (Point Pelee) Does any other part of Canada extend farther east than Nova Scotia? What is it?

2. SIZE

What is the area of the land surface of Ontario? What is the area of Nova Scotia? How many provinces the size of Nova Scotia could be carved out of Ontario? Compare the size of Nova Scotia with that of New Brunswick. It is almost as large as Belgium and Holland put together, and it is half the size of New York State. What is the length of Nova Scotia? Its width?

3. PHYSICAL FEATURES

Surface:

What is the general shape of Nova Scotia? What forms the main axis of the Province? (A mountain ridge, or watershed, running from the north-east to the south-west.) Note another mountain ridge running in an east-west direction from Cape Chignecto to Canso Strait. Do these ranges determine the shape of the country? In what way? How, too, do they determine the general slopes? What is the relation of these slopes to the direction of the rivers? Why? How would you account for the V-shaped depression occupied by the waters of Minas Channel, Minas Basin, and Cobequid Bay? Draw an outline map of the Bay of Fundy and its arms.

The Atlantic Slope:

About how wide is this slope? (Average width is twenty-one miles.) Describe the surface of this slope. Why is it so rough and broken? (It is an old weathered highland of hard rock.) What portions are covered with soil? (Chiefly the narrow river valleys) What remarkable feature is noticed along the Atlantic shore-line? Account for the presence of so many harbours. (They

are submerged mouths of rivers.) Name a few of the largest harbours. How would you account for the origin of the Strait of Canso? How large is it? (Length, fourteen and one half miles; width, three quarters of a mile; depth, nowhere less than ninety feet.) What bays does it connect? (See illustration on page 96 of the Textbook.)

The Bay of Fundy Slope:

Compare this slope with the Atlantic slope as to surface, rivers, shores, etc. Why has the Bay of Fundy comparatively few harbours? Is it because there is a secondary mountain ridge (the North Mountains) running parallel to, and close to, the coast? Why do you think so? What productive valley is immediately south of the North Mountains? What break in these mountains allows the lower part of the Annapolis Valley to fill with water? What name is given to this sheet of water? Are these North Mountains responsible, too, for Digby Neck, and St. Mary's Bay? Why do you think so? What cape forms the eastern end of this range?

What tide phenomena are seen in the Bay of Fundy and especially in its upper arms? How high do these tides rise? Where do they rise highest? Why? Point out the effect of these high tides upon the low-lying shores of Minas Basin. What effect have these tides upon the navigation of rivers flowing into the Bay and its arms? Explain. What happens to ships when the tide is out of the rivers?

The Gulf of St. Lawrence Slope:

The land slopes gently to the Gulf and the shores are comparatively low. As on the Atlantic slope, what is the relation of the harbours to the rivers? What is the largest and best harbour?

Cape Breton Island:

Which side of the Island has the most broken shoreline? Why? What lake is there in the interior of the Island? Is it salt or fresh? Why? Name two good harbours on the Island. Locate them on the map.

What island is out in the Atlantic about 200 miles east of Halifax? Describe its surface. Why is it so dangerous as to be called the "Graveyard of the Atlantic"?

Drainage:

Into what three general slopes is the drainage system of Nova Scotia divided? What are the chief characteristics of the rivers of the Atlantic slope? Why are they short? Why are there so many? Why do they not unite and form a large river? Are they navigable? Why not? Of what use are their mouths?

Where is the Annapolis Valley? Between what mountain ridges does it lie? What river drains the valley toward the west? Into what Basin does the Annapolis River flow? What connects this Basin with the Bay of Fundy? What river flows eastward through the valley? (Cornwallis River) Into what body of water does it flow? Name a river flowing into Cobequid Bay. Locate these rivers on the wall map.

Is the navigation of rivers flowing into the Gulf of St. Lawrence helped by the tides to the same extent? Why not? In what respects are the rivers flowing into the Gulf of St. Lawrence like those of the Atlantic slope? Why are the Cape Breton rivers so unimportant?

Soil:

If Nova Scotia is a rocky highland plateau in the process of being worn down, in what condition is most of its surface likely to be? Where is most of its arable land

found? Why? Why are the low-lying lands around the shores of Minas Basin particularly fertile?

4. CLIMATE

The general influences that modify climate are latitude, elevation, proximity to the sea, ocean currents, winds, rainfall, etc. How many of these influences apply to Nova Scotia? In what way? Why has Nova Scotia a maritime climate? How does this affect the rainfall? What two ocean currents influence its climate? In what way? Nova Scotia extends through the same latitude as the country lying between Toronto and Quebec City; compare the climates of the two districts. Which is subject to the greater extremes? Why? Why is Nova Scotia more subject to fogs than Ontario? What influence has the North Mountain ridge upon the climate of the Annapolis Valley? Why? What is the average yearly rainfall of Nova Scotia? (See the Text-book.) What is the rainfall in Ontario? (Thirty to forty inches) What makes the climate of Nova Scotia so invigorating?

5. NATURAL RESOURCES

Name at least four of the chief natural resources of Nova Scotia. What connection have they with the leading industries of the Province? Illustrate. More detailed information will be supplied when the various industries are under consideration.

6. INDUSTRIES

Agriculture:

Why is agriculture not carried on so extensively as in Ontario and the Prairie Provinces? Where are the chief agricultural districts of Nova Scotia situated. Account

for this. What conditions are favourable to the growth of hay and root-crops? What industries depend upon these crops and upon grazing for their success? Give a list of the grains grown in Nova Scotia.

Fruit:

What part of Nova Scotia is famous for its fruit? What are the conditions favourable to fruit-growing in this Valley? Name the chief fruits grown and exported. What uses are made of cold storage warehouses in connection with this industry? What factors are favourable to the export of fruit? What advantages has Nova Scotia over Ontario in the fruit export trade? Why?

Fishing:

What physical conditions are favourable to the fishing industry? Name the principal food fishes of Nova Scotia. How are the fish prepared for market? To what countries does Nova Scotia export fish? Why is it necessary for warm countries, such as Southern Europe, Brazil, and the West Indies to import fish? Ships that carry cargoes of fish to these countries will probably carry what cargoes on their return trip? Why? Which is more important, the fishing industry of Nova Scotia or that of Ontario? Why? What are the chief fishing grounds of Ontario fishermen? Compare the value of the fish and the number of men employed in fishing, in Nova Scotia and Ontario. (Nova Scotia's catch is valued at about $8,000,000 annually; Ontario's, at about $2,000,000. In Nova Scotia there are about 30,000 men employed and in Ontario about 3,000 men.)

Mining :

Name the four principal minerals found in Nova Scotia. Name, and point out on the map, the three chief

centres of coal-mining. What mineral is found in close proximity to the coal-mines? Of what economic importance is this? What Cape Breton city has very extensive iron and steel works? In what condition is gold found? In what parts of Nova Scotia is gold mining carried on? Where is gypsum found? What are its principal commercial uses?

Lumbering and Ship-building:

"Pine has practically disappeared from Nova Scotia." Why did pine disappear so much more rapidly than other timber? Where are the chief markets for Nova Scotia's export lumber trade. What factors made Nova Scotia formerly a great ship-building country? What causes have led to a great decline in this industry? At what place is ship-building still carried on to some extent? (Yarmouth)

Manufacturing:

What is the chief manufacturing industry of Nova Scotia? (Iron and steel) What conditions are favourable for this industry? What is its chief centre? At what place are there extensive car works? Name the other leading manufacturing industries of the Province.

7. TRANSPORTATION

In what respects is Nova Scotia so favourably situated for carrying on a world-wide commerce? With what countries does it carry on most of its trade? Name, and trace on the map, its leading railways, and show the part each has in the trade of the Province.

8. TRADE AND COMMERCE

Exports and imports:

Under what conditions of production is it possible for Nova Scotia to export goods to foreign countries? What kind of goods must Nova Scotia import? Why? What are the chief imports? The chief exports? Through what ports is this trade carried on? What are the chief trade routes with other parts of Canada?

9. PEOPLE AND GOVERNMENT

The people of Nova Scotia are chiefly descendants of the French Acadians, the United Empire Loyalists, the Europeans (including the Highland Scots of Cape Breton Island and the German settlers in Lunenburg). What was the population of Nova Scotia according to the latest census returns? Is its population increasing? Compare with previous censuses. (See Canadian Almanac.) How does the population of Nova Scotia compare with that of the city of Montreal?

Of what branches does the government of Nova Scotia consist? In what important respect does this differ from that of Ontario? Name the Provinces whose Legislatures each contain two houses, namely, a Legislative Council and a Legislative Assembly.

10. CITIES AND CHIEF TOWNS

What is the capital city? What educational institutions are situated at Halifax? It is a naval station and has a government dry-dock. Explain what these are. Why is Halifax strongly fortified? What features make Halifax Harbour one of the best in the world? Name the chief city on Cape Breton Island. Account for its

origin and growth. Locate Pictou and New Glasgow. Of what does their trade chiefly consist? What town is at the extreme west end of the Province? What is its trade? With what American city has it steamship connection? What town has the Normal School and the Agricultural College? Locate it on the map. Locate Springhill. What is its chief industry? Name, and point out on the map, the chief station for wireless telegraphy across the Atlantic Ocean. Find Amherst, the third town in size. What is Amherst's chief industry? Name and locate Windsor and Wolfville, and name an important educational institution in each. Locate, on the map, Grand Pré, the scene of the expulsion of the Acadians. Why is the district surrounding Grand Pré called "Evangeline's Land"? Why does Nova Scotia make such a delightful summer resort for tourists?

CHAPTER XII

FORM IV, JUNIOR GRADE

DETAILS OF THE COURSE

THE EARTH AS A PLANET

FORM:

Proofs of the earth's rotundity; diameter, circumference.

Size:

Measured by time required to travel around it; compare with the time required to cross the Atlantic; with the time required by Columbus for his voyage to America.

Motion:

Compare with a spinning top circling about the floor; the earth's orbit; year, leap year.

Seasons:

Inclination of the earth's axis; distribution of light; variation in length of day and night—consult the almanac; cause of seasons; equinoxes.

For hints on the teaching of the following topics, see "Suggestions for Lessons", Chapter XIII: The Earth as a Planet, the Earth's Orbit, the Inclination of the Earth's Axis, Variation in the Length of Day and Night, the Cause of the Seasons.

LATITUDE AND LONGITUDE

1. Measurement of circles.
2. How to locate a point.

3. Latitude and parallels of latitude:
   (1) Meaning,
   (2) Use.
4. Meridians and longitude:
   (1) Meaning,
   (2) Use.
5. Latitude and longitude:
   How determined on the map.
6. Longitude and time.
7. How latitude and longitude are determined at sea.
8. Standard time.

For hints on the teaching of Latitude and Longitude, see "Suggestions for Lessons", Chapter XIII.

CONTINENT STRUCTURE, ETC.

1. Origin of continents.
2. Modification of coast-lines:
   Type: Coast-line of North America.
3. Continental physical features:
   (1) North America
   (2) South America
   (3) Europe
   (4) Asia
   (5) Africa
   (6) Australia.
4. Influence of topography upon civilization.
5. General review.

For hints on the teaching of the following topics, see "Suggestions for Lessons", Chapter XIII: Continent Structure, Influence of Topography upon Civilization, World Barriers.

EUROPE

1. Location:
   (1) In reference to other continents
   (2) Compare with latitude of Canada.
2. Size.
3. Coast-line:
   (1) Comparison with other continents. Advantage.
   (2) Names of principal coast features—seas, gulfs, bays, straits, capes, etc. State one interesting fact about each.
4. Surface features, drainage:
   (1) Review facts taught in Form III, Junior Grade.
   (2) Mountains and rivers that form boundaries between countries. Effect upon local races, languages, and customs.
   (3) Non-boundary mountains and rivers.
5. The countries, with capitals:
   Associate with each country some interesting characteristic, such as, Holland: quaint customs, dikes, canals, windmills.
6. Climate and vegetation:
   Elements that affect the climate of Europe: Latitude, westerly winds, rainfall, effect of mountain ranges.
   Compare the climates of Western and Eastern Europe. Account for the difference.
   Compare the climate of Western Europe with that of Eastern North America in the same latitude. Give reasons for the difference.

7. Occupations of people:
   (1) Basic factors: fertile soil, proximity of sea, accessibility to world's markets, presence of mines, labour
   (2) The principal industries and exports of each country
   (3) The chief commercial cities, particularly the world-renowned seaports
   (4) World trade routes.

8. Peoples, Governments.

NORTH AMERICA

A review of work assigned for Junior Grade of Form III. Consider particularly not only physical conditions, but investigate the reasons for these conditions. Show, by concrete examples, that physical conditions, in large measure determine the industrial life of the people and form the basis for commercial and social development.

SOUTH AMERICA

Follow the same general line of study as for North America and Europe. The chief points to be considered are position, form, size, relief, drainage, climate, industries and industrial regions, centres of population, chief countries and cities, people and their government.

Compare the physical conditions of this continent, such as, relief, drainage, soil, climate, seasons, etc., with those of North America.

CHAPTER XIII

FORM IV, JUNIOR GRADE

SUGGESTIONS FOR LESSONS

THE EARTH AS A PLANET

In addition to the daily rotation of the earth on its axis (see page 92), the earth has another motion. What is it? It has this motion round the sun in common with the other planets of the solar system. (See page 119.)

How long does it take the earth to make one revolution round the sun? It takes it almost 365¼ days. What name is given to this interval of time? Why is every fourth year made a "leap year"? If you are given the number designating the year, how can you tell whether it is a leap year or not? If the number is divisible by four, it is called a leap year. What exception is there to this general rule? The last year of a century is not considered a leap year unless its designation number is divisible by 400. For example, of the years 1600, 1700, 1800, and 1900, only the year 1600 was a leap year. The year 1896 was a leap year; the next leap year was 1904, after an interval of eight years. What is the reason of this? The sun year is a little less than 365¼ days, and unless three leap years were dropped every four centuries, our time would get faster than the sun time.

THE EARTH'S ORBIT

The pathway on which the earth is supposed to travel round the sun is called its *orbit*. It is almost, but not quite, a circle; it is a sort of flattened circle. Make a

drawing of it on the black-board, and mark the sun a little to one side of its centre. Note that this will bring the earth a little nearer to the sun at certain times of the year than at others. Strange to say, the earth is nearer the sun in winter than it is in summer. It is the slanting rays of the winter sun that counteract this advantage. Perhaps you have noticed that the sun appears somewhat larger in mid-winter than it does in midsummer.

What is meant by the *plane of the earth's orbit*? A very clear notion of it may be obtained by imagining the sun to be a large, stationary buoy floating, half submerged, on the surface of a perfectly smooth sea. Then imagine the earth to be a ball, also half submerged, floating swiftly in a circle round the sun-buoy. This circular pathway will represent the earth's orbit, and the surface of the water will represent the plane of the earth's orbit. Note that the orbit lies on this plane all the way round and that the plane cuts the earth into halves.

THE INCLINATION OF THE EARTH'S AXIS

The earth does not move round the sun with its axis straight up and down. It is tilted a little, so that it is always inclined about $23\frac{1}{2}$ degrees from the upright position. Draw an upright line on the black-board; draw another line inclined to it so that the angle between them is $23\frac{1}{2}$ degrees—a little larger than one quarter of a right angle. As the earth moves round the sun, this inclination makes the axis always point toward the North Star. (See diagram, page 11, Text-book.)

VARIATION IN THE LENGTH OF DAY AND NIGHT

Take a small globe on which are represented the poles, the equator, and a few circles parallel to the equator. Do not forget that the earth's axis always points to that part

of the heavens where the North Star is, and that the earth turns on its axis always from west to east, the direction indicated by the equator and the circles that are parallel to it. Hold the globe in front of a lighted candle. How much of its surface is lighted up? How much of it is in shadow?

Cut a hole, the size of the globe, in a piece of cardboard, insert the globe, and hold it in such a way that the lighted half of its surface is on one side of the cardboard and the shadowed half on the other side. The line where the cardboard and globe meet will represent the circle of illumination. (See diagram, page 13, Text-book.) Place the globe so that its poles are equally distant from the candle. Note that when the globe is in this position the circle of illumination passes through the poles. Why is this?

Examine the circles on the globe that are parallel to the equator. What part of each of these circles is in candle-light? In shadow? One half of each circle is in candle-light and the other half is in shadow. Locate on the globe a circle about half-way between the equator and the north pole. This circle will indicate, approximately, the distance that we are north of the equator. Mark a point on this circle; keeping the globe in the cardboard, rotate it once at a uniform rate before the lighted candle. How long a time is this point in candle-light? How long is it in shadow? Why is the time the same in each case?

This illustration should give us the explanation why day and night are equal in length when the poles are equally distant from the sun. Every twenty-four hours the earth turns on its axis once and carries us round with it in a circle. If the sun shines directly upon us for half of our daily circle-journey, and if we are in the shadow

of the earth for the other half, it follows that there must be twelve hours of day followed by twelve hours of night. This happens twice every year—at the Spring and the Autumn equinoxes.

Next, place the globe in the cardboard so that the north pole is tilted toward the candle. How much of the circle is now exposed to the candle-light? How much of it is on the shadowed side? Measure accurately. If, say, five eighths of the circle is in candle-light and three eighths of it in shadow, and if the globe is rotated once at a uniform rate, it follows that the marked point on the circle will be in the light five eighths of the time and in shadow three eighths of the time.

If these conditions apply to the earth and sun, then, during one circle-journey around the earth, we shall be in direct sunlight for fifteen hours (that is, five eighths of twenty-four hours) and in the shadow of the earth for nine hours. This happens on or about June 21st every year.

Similarly, when the north pole is turned away from the sun, we have short days and long nights. Of course all the above changes take place gradually as the earth revolves about the sun. We referred to this, if you remember, in our observations in connection with "The Seasons", (see page 71).

We have here the explanation of the facts learned in connection with the observation lesson on the "Variation in the Length of Day and Night" (see page 75). The sun *appears* to us to move in a great circle around the earth. The arc traced by the sun in the sky in the daytime on or about June 21st forms more than half of this imaginary sun-circle, and the day is therefore longer than the night. On or about December 21st the arc is less than

half the sun-circle and the day is therefore shorter than the night. On or about March 21st and September 21st the arc is half of the sun-circle and therefore the day and night are equal in length.

We know that the sun does not really move round the earth. The observations referred to above, as well as those made in connection with the lesson on "The Earth's Rotation" (see page 92), show us that it is we who are journeying every day, while the sun is shining upon us, from the place from which we see the sun rise to the place from which we see it set. It is the rotating earth that is carrying us round in a circle once every twenty-four hours past the stationary sun. The moving of the sun across the sky is only an illusion, like that of the moving fence and trees seen from the window of a fast railway train.

THE CAUSE OF THE SEASONS

If the earth always moved round the sun with its axis straight up and down, the sun's rays would always shine upon the earth with exactly the same degree of slant; that is, the shadows cast by the sun would always be exactly the same in length. There would be no lengthening of shadows as winter approaches, and no shortening of them as summer draws near.

Again, if the earth's axis were straight up and down, there would be no variation in the length of day and night. Every place would always have twelve hours day and twelve hours night, and the amount of heat that any particular place would receive would be practically the same all the year round. In other words, there would be but one season, not four, during the year.

You will thus see that the real cause of the seasons must be the inclination of the axis of the earth. Since

the axis always points toward the North Star, it follows that, as the earth journeys round the sun, each pole is in the sunlight for six months, and then in the shadow of the earth for the remaining six months of the year. Illustrate this by means of a hat-pin and an apple.

Show that, when the earth's axis has its greatest inclination toward the sun, the latter's vertical rays will reach their farthest point north, namely, on the Tropic of Cancer; this takes place on or about June 21st, and gives us the longest day in the year. Show also that, when the axis has its greatest inclination away from the sun, the latter's vertical rays will reach their farthest point south, namely, on the Tropic of Capricorn; this takes place on or about December 21st and gives us the shortest day in the year.

When the sun is over the Tropic of Cancer, it is high up in the sky and its rays give us summer's heat; but when the sun is over the Tropic of Capricorn, it is low down in the sky and its rays contain so little heat that we have winter's cold.

The tilting of the earth to, and away from, the sun, will explain why the sun appears to change its position in the sky to the south of us, being high up in summer and low down in winter. (See page 73.) Why have we winter when the sun's rays are most slanting, and summer when they are nearly vertical? It is because the sun's rays not only pass through the thicker layer of air, but also because they spread themselves over a greater area of surface than the more vertical rays do. Illustrate both of these factors by diagrams on the black-board.

Note that the most slanting rays are accompanied by the shortest days of sunlight, and that the nearly vertical rays are accompanied by the longest days of sunlight.

Note, too, that twice during the year, as the earth is revolving round the sun, the two poles are equally distant from the sun. It is at these times we have the equinoxes —equal day and night. Make further use of the apple and hat-pin and of black-board diagrams until the succession of the seasons is clearly understood. (See diagrams, pages 14-15, Text-book.)

Thus we find that the causes of the seasons, which were deduced from observations that were made of the sun's shadows throughout the year (see pages 69-75), are now explained.

LATITUDE AND LONGITUDE

MEASUREMENT OF CIRCLES

Draw a *circle* on the black-board. What is a circle? In geographical language, a circle is an endless line drawn around a point, and always the same distance from that point. That point is called its *centre.*

Every circle, whatever its size, is supposed to be divided into 360 equal parts which are called *degrees.* Each degree is again divided into 60 *minutes*; and each minute into 60 *seconds.*

The earth's equator is a great circle. What is its centre? What is the length of the equator? How many miles long is a degree at the equator? 25000 miles $\div$ 360 $=$ 69$\frac{1}{2}$ miles, nearly. How many miles are there in one minute? What name is given to a straight line drawn from one part of the equator through the centre of the earth to the equator on the opposite side of the earth? How long is this diameter? What name is given to a straight line from the surface of the earth to its centre? How long is it?

How many degrees are there in the circumference of the earth? Why? How many degrees are there between

the two poles? Why? How many degrees are there between the equator and either pole? Why?

Repeat the table for circular measure.

There are 60 seconds (″) in 1 minute (′),
60 minutes in 1 degree (°),
and 360 degrees in 1 circle.

Illustrate by circles drawn on the black-board.

HOW TO LOCATE A POINT

Mark a point on a blank black-board. How can the location of this particular point be determined? Can it be located by saying that it is a certain distance from the top of the black-board? Why not? This does not locate it definitely, because each of a whole series of points extending across the black-board from end to end may have its location thus described. What other factor is necessary in order to locate exactly the given point? It will be necessary to state its distance from the end of the black-board. If, for example, we say that it is two feet five inches from the top of the board and four feet ten inches from its end (left), we know the exact location of it and that no other point on the black-board can have this location. Note that the top and the end of the board are really two lines at right angles to each other and that the given point lies between them.

Locate definitely a point marked at random on a blank page of your scribbling book. Note that the two edges of the page, from which the measurements are made, form two lines at right angles to each other and that the given point whose location is sought lies between them.

Similarly, it may be shown that any point on a surface can be readily located provided that it lies between two

lines that are at right angles to each other. Illustrate this by one or two examples on the black-board.

An application of this principle is seen in the location of farms in a township. (See lesson on "The Township", page 79). Locate, for example, the farm known as "Lot 12, Con. 7". Why are you sure that you have correctly located it? It is situated on the seventh concession numbered from the town line at one side of the township, and it is on the twelfth lot numbered from the town line at one end of the township. These town lines are really two lines at right angles to each other, and the farm located lies between them.

LATITUDE AND PARALLELS OF LATITUDE

How are places located upon the earth? Place a chalk mark upon the surface of the school globe. Can you describe accurately its location? Why is it difficult to do this? Let us look for two lines at right angles to each other between which is the point marked.

In measuring distance north and south on the earth, it has been agreed to take the equator as the starting-place. On which side of the equator is the point that was marked? How far is it from the equator? The distance north or south of the equator is measured, not by miles, but by degrees, each of which is, as we have seen, almost seventy miles. How many degrees are there between the equator and the poles? To make the measuring easy, circles are drawn around the earth parallel to the equator; the distance between these circles depends upon the scale on which the map is drawn. (See diagrams, page 17, Text-book.) What is the distance in degrees between these circles on your globe? On the map of the world? On the map of North America? On the map of Canada? On the map of Ontario? With the help of these circles,

calculate, in degrees, how far London (England), Montreal, New York, Calcutta, etc., are north of the equator. Practise exercises like this on the globe and on the maps of the continents.

The distance of any place from the equator in degrees is called its *latitude*. The degrees in latitude never vary in length. Why not? The circles that help in marking the latitude are called *parallels of latitude*. What is meant by north latitude (N. Lat.)? By south latitude (S. Lat.)? What is meant by saying that Petrograd is in sixty degrees N. Lat.? That London (Ontario) is in forty-three degrees N. Lat.? That Rio de Janeiro (Brazil) is in S. Lat. twenty-three degrees? Drill thoroughly on various maps until you can readily determine the latitude of places in any part of the world.

MERIDIANS AND LONGITUDE

Just as it is necessary to have a line (the equator) as a starting-place for measuring distance north and south, so it is necessary to have a line for a starting-place when measuring distance east and west on the earth. In what direction must this line run? Why must it run north and south?

When measuring east and west, it has been agreed to take a *meridian line* for the starting-place. What is a meridian line? It is a line upon which the sun's shadow falls when it is noon. Where is our meridian or noon line? It is the line drawn north and south through the noon shadow cast by the stake in the school yard. (See lesson on "Seasons", page 70.) How long is this meridian line of ours? We may imagine it to extend north to the North Pole and south to the South Pole; in other words, our meridian is a north-and-south noon line that is supposed to run from pole to pole passing through

here on its way. Since the sun crosses this line every day at noon, it follows that every place on it will have noon at exactly the same time that we do. What other places have meridians? Every place must have its own meridian. Why? What is Toronto's meridian? Keep in mind that meridians are north-and-south noon lines; and note that they cross the equator at right angles (what does this mean?), and that they are really semicircles meeting at the poles. (See diagram, page 317, *Ontario High School Physical Geography.*) Why are they semicircles?

It is the meridian that passes through London (England) that has been agreed upon as the starting-place for measuring distances east and west on the earth. It is for this reason that it is called the *First Meridian.* Find it on the globe and on the map; you will find it marked "0°".

Distance east or west of the First Meridian is called *longitude*; it is always expressed in degrees. What does west longitude (W. Long.) mean? East longitude (E. Long.)? If two persons leave Greenwich at exactly the same time and travel at exactly the same rate, one going east, the other west, where will they meet? They will meet half-way round the globe—at 180 degrees of longitude, that being half of 360 degrees. Find the 180th meridian on the map or globe.

Now, just as parallels of latitude were drawn at certain intervals to help in measuring distance north or south of the equator, so meridians are drawn at certain intervals to the east and west of the First Meridian to help in measuring distances east or west, the intervals depending upon the scale on which the map is drawn. The measurements in degrees are made along the equator. (See diagram, page 13, Text-book.)

What names are given to the different meridians? The one that crosses the equator 5 degrees west of the First Meridian is called the 5th meridian W. Long. What is the name of the one that crosses the equator 30 degrees east of the First Meridian? Is the 180th meridian in W. Long. or in E. Long.? As it is the same distance to the east or to the west of the First Meridian, it is simply called the 180th meridian. What group of islands in the Pacific Ocean is crossed by this meridian? If meridians cross the equator at intervals of one degree, how many of them are there between the First Meridian and the 180th? Note that these meridians are farthest apart at the equator and that they meet at the poles. The length of a longitude degree therefore varies. It is greatest at the equator (almost 70 miles); at the poles its length is 0. Except in a few cases which need not be considered here, the latitude degree, as already noticed, never varies in length; it is always approximately 70 miles. Drill thoroughly on various maps until the pupils can readily determine the longitude of places in all parts of the world. (See diagram, page 13, Text-book.)

LATITUDE AND LONGITUDE

Where do East Longitude and West Longitude meet? They meet, as already noted, at the 180th meridian. Into how many sections, therefore, is the earth's surface divided by the equator and the First Meridian? What are they? They are: (*a*) That part of the earth north of the equator and west of the First Meridian as far as the 180th meridian. (*b*) That part north of the equator and east of the First Meridian as far as the 180th meridian. (*c*) That part south of the equator and west of the First Meridian as far as the 180th meridian.

(*d*) That part south of the equator and east of the First Meridian as far as the 180th meridian.

Locate these sections on the globe and note that each forms one quarter of the earth's surface. Name and locate on a map of the world important countries, cities, etc., in each section. Note that any place in any of these sections lies between two lines that are at right angles to each other. What are these lines in each of the four sections? They are the equator and the First Meridian.

Find, for example, the situation of Winnipeg. Measure in degrees how far it is north of the equator. It is 50 degrees. Next, measure in degrees how far it is west of the First Meridian. It is about 97 degrees. What, then, is the location of Winnipeg? It is approximately in N. Lat. 50° and W. Long. 97°.

Note that this method of locating Winnipeg is the same as that used in locating a point on the black-board or on the blank page of an exercise book. It is also the same method as that used in locating farms in a township.

A ship is reported by wireless telegraphy to be in distress in N. Lat. 36° 25′ and W. Long. 48° 40′. Locate this point on the map as nearly as you can. Practise exercises such as this until you can, by using the map, determine the latitude and longitude of any place that may be named; or can locate approximately any point whose latitude and longitude is known.

LONGITUDE AND TIME

In what part of the sky do we see the sun at noon? Where do the people of Halifax see it when it is noon with them? When it is noon in Toronto, can it be noon at Vancouver at the same time? Why not? It is because

the sun cannot be directly over the noon line at Toronto and at Vancouver at the same time. *Different meridians have their noon at different times.*

In what direction is the earth rotating? If it is rotating from west to east, which city will have sunrise earlier, Toronto or Halifax? Toronto or Vancouver? Why? Which of these will have noon first? Why?

Through how many degrees does a place pass while the earth makes one rotation? Explain this. How many hours does it take a place to pass through these 360 degrees? Through how many degrees does it pass every hour? How does this affect the time of places that have different noon lines, or meridians? There will be a difference in time of one hour for every 15 degrees east or west. If Halifax is 63° W. Long. and Peterborough 78° W. Long., what is the difference in their time? Which sees the sun rise first? When it is noon at Halifax, what time is it at Peterborough? When it is noon at London (England) what time is it at 15° W. Long.? At 15° E. Long.? At 30° W. Long.? At 45° E. Long.? At the 180th meridian? When it is noon at London (England), what is the time, respectively, at Naples, Petrograd, Manilla, Philadelphia, Denver, Fort William, and New Orleans? Consult the map. (See diagram, page 13, Text-book.)

If you started at London (England) at noon and travelled westward, what change would you have to make in your time for every 15 degrees? Does the traveller going west gain or lose time? If he kept on travelling westward until he got back to his starting-place, how much time would he gain? Explain how he would gain a whole day of twenty-four hours. If he circled the earth, going eastward, how much time would he lose?

Suppose there are three men, A, B, and C: A stayed at home; B travelled around the earth, going westward all the way; C also travelled around the earth, going eastward all the way. B and C started their journey from the same place and at the same time, and both returned at the same time. A says that they were away ninety days; B maintains that he has been away ninety-one days; while C maintains that he was eighty-nine days away. Not one of the three agree as to the intervening time. How would you explain their difficulty?

How do sea-captains and sailors overcome this difficulty and keep their time right? When they are crossing the Pacific Ocean and reach a line called the *International Date Line,* which is in the neighbourhood of the 180th meridian, they change their time reckoning exactly one day. For example, if they reach this line on their westward voyage on Saturday noon, they call it Sunday noon; but if they reach it on Saturday noon when east-bound they call it Friday noon. If B and C, in the illustration used above, had done this, their time would have agreed with that of A who stayed at home.*

STANDARD TIME

The greater part of Canada is situated between the 60th and the 135th meridians—a width of approximately 75 degrees. If there is a difference in sun time of one hour for every 15 degrees, what is the approximate difference in time between the Atlantic and Pacific coasts of Canada? Why does this make it difficult for transcontinental railways to arrange their time-tables. Travellers,

*For methods used in determining Latitude and Longitude, see *Ontario High School Physical Geography,* pages 318-319.

too, would find a difference in sun time of five hours rather inconvenient. Why?

To overcome this difficulty, Canada has been divided into five belts or districts whose width from east to west is, approximately, 15 degrees each. These belts are associated, respectively, with the 60th, the 75th, the 90th, the 105th, and the 120th meridians.

What is the difference in sun time between the First Meridian at Greenwich and the 60th meridian? The time at the 60th meridian is four hours slower than Greenwich time. Similarly, the time at the 75th, at the 90th, at the 105th, and at the 120th meridians is, respectively, five hours, six hours, seven hours, and eight hours slower than Greenwich time.

Note that the time belts are so arranged that their boundaries are largely provincial. (See Text-book.) The Maritime Provinces are associated with the 60th meridian; Ontario and Quebec to the Great Lakes, with the 75th; Western Ontario and Manitoba, with the 90th; Saskatchewan and Alberta, with the 105th; and British Columbia with the 120th. By this arrangement the time in Ontario is one hour slower than that of the Maritime Provinces; Manitoba's time one hour slower than that of Ontario; etc.

When it is 12 o'clock noon at London (England) what time is it in the Maritime Provinces? In Ontario? When it is noon in Ontario what time is it at Halifax, Winnipeg, Regina, Calgary, and Vancouver, respectively? When the Ontario schools are being dismissed at 12 o'clock noon, what is probably taking place in the schools of British Columbia? Why?

CONTINENT STRUCTURE

ORIGIN OF CONTINENTS

The story of the origin and growth of continents is a very interesting one. The secret was discovered by men called geologists, who have made a very careful study of the rocks; and, although they have not yet been able to learn many of the details, enough is now known to make the story a probable one.

These geologists tell us that ages and ages ago the earth mass was much warmer than it is now and that it has been gradually cooling off. They also tell us that its rock surface was much more uniform; that, comparatively speaking, its ridges were not so high nor its depressions so deep as at present. Hence the oceans at that time were probably more extensive in area but not so great in depth as our oceans are. As the earth gradually cooled, it gradually shrunk in size, just as most substances do when cooling. As this shrinking process continued, the rock surface of the earth became more and more folded into higher ridges and lower depressions, in much the same way that the skin of a hot, baked apple does when cooling.

In course of time the folds, or ridges, gradually rose higher and higher above the surface of the shallow ocean, carrying up with them broad ocean-bottom plains that were lying at or near the surface. These ridges, with the low adjoining plains, formed the beginning of the continents, as we now know them. In the meantime the waters of the shallow ocean gradually withdrew into the deeper depressions that were being formed in the underwater rock surface. In this way the oceans, as we now know them, began to form.

It is believed that the land surface of the earth is not yet stationary; that it is still rising in places and sinking in others; and that this rising and sinking is taking place so gradually that centuries may pass before the results are noticeable. It is believed too, that the general outlines of the continents as well as their characteristic surface features are, in the main, the direct result of this undulatory movement of the earth's crust.

Not only have the surface features of the continents been greatly changed by the earth's contraction forces, but they have been further modified by the erosion work of rivers and other agencies that have cut deeply into the rock surface; depressions thus formed vary in character from the steep-sided gorge to the deep, broad valley. The sea bottoms, on the other hand, not being subject to such erosion-forces, are likely to have surfaces much more uniform in character. This is probably why a sinking coast region is likely to produce a broken shore-line; and a rising coast region, a comparatively unbroken shore-line.

NORTH AMERICA

The above theory will account for the broken shore-lines of the northern half, as well as for the comparatively unbroken shore-lines of the southern half of the North American continent. (See "Shore Forms of North America", page 103.)

According to geologists, the northern coast regions of North America have been gradually sinking, until the sea has at length entered the river mouths and valleys, forming many harbours, bays, etc.; while the higher land forms still remain above water, forming peninsulas, capes, islands, etc. Thus Newfoundland Island, the Gulf of St. Lawrence, the wide mouth of the St. Lawrence River,

Belle Isle Strait, the Nova Scotian Peninsula, the Bay of Fundy, as well as the many other shore forms found along the coasts of Canada—east, west, north—have been caused or have been greatly modified in this way.

On the other hand, the theory suggests that the rising of the more or less uniform sea bottoms contiguous to the original shore-line will explain the almost unbroken shore-lines of the southern half of the continent. If the south-eastern, southern, and western coasts of the United States and the coasts of Mexico and Central America are carefully examined on a wall map of North America, comparatively few harbours and other shore forms will be found.

Experiment: In a deep tray make a plasticine model of North America; surround the model with an evenly-sloping margin to represent the sea bed contiguous to the shore-line; pour sufficient water around the model to reach the shore-line; and then tilt the tray slightly so that the end representing the north is lowered and the other end raised. What is the result? How does this experiment help to explain the character of the North American coast-lines?

The pupils of this Grade have already studied the general features of North America and should, therefore, be familiar with its highlands, slopes, plains, and river basins. If North America has been well taught, the knowledge obtained and the method followed should serve as a guide in the teaching of the other continents.

SOUTH AMERICA

Review the three highlands of South America, the continental axis, the chief river basins, and the regular coast-line. (See Relief Map, page 225, *The Story of the Earth*

and Its Peoples.) The South American coast regions have been rising and are unbroken because the level sea bottoms are being raised. There is, consequently, a general absence of good, natural harbours. This is particularly true of the Pacific coast. What effect must this have upon the development of the continent?

EUROPE

Physically Europe and Asia form a single continent, called Eurasia; but as Europe has so long been considered a continent by itself and has been so long regarded as the home of the civilized races it is usual to consider it separately.

What is its area? It has the longest coast-line in proportion to its area of any of the continents. Verify this statement. Why is the coast-line so much broken? Its shores, especially in the north and west, have been sinking thus forming many inlets. The Baltic Sea and its gulfs are old land valleys that have been submerged. Name a few of the other inlets on these coasts. In Southern Europe the rising and sinking of the land areas, while the mountains were forming, has made many peninsulas, seas, etc. The Mediterranean Sea occupies a deep depression formed by the sinking of the earth's crust. Locate on the map of Europe the chief coast features of the Mediterranean. What effect has Europe's much broken coast-line had upon its development as a continent?

What is the primary highland of Europe? The Alps and associated mountains. Note that the Alps Mountains form a hub, as it were, from which radiate minor ranges in all directions. Name and locate them. This system of mountain ranges has more or less isolated many areas of Europe from one another. What results have such

physical barriers had upon race and language development? Give instances. Trace the continental axis of Europe from Cape Finisterre ("End of the Land") over the Cantabrian, the Pyrenees, Alps, Dinaric Alps, and Balkan Ranges to the Dardanelles. The Caucasus Range seems to be a continuation eastward of the Carpathian Mountains, from which it is separated by a depression (Black Sea). The Alps and associated highlands form the great plateau region of Central Europe. What important rivers flow from this plateau? What branch of the Alps extend south into Italy? (Study Relief Map, page 297, *The Story of the Earth and Its Peoples.*)

What mountains form a secondary highland? The Scandinavian Mountains. What great lowland plain lies between the primary and secondary highlands? Note its great extent—from the Atlantic to the Ural Mountains. Trace the drainage divide that separates it into two slopes; one, sloping north-west to the Arctic and Atlantic; and the other, south-east to the Caspian and Black Seas. What are the chief rivers in each slope? Note that the waters of the Black Sea Basin force their way through the continental axis at the Bosphorus (Ox-ford) and the Dardanelles.

ASIA

Owing to its inaccessibility, comparatively little is known of the mountain system of Central Asia. We know that there is a great mass or knot of mountains north-west of India called the Pamirs ("Roof of the World") from which, like the Alps in Europe, radiate ranges in various directions. The Himalayas, Kuen-lun, and Tian-Shan extend eastward; the Hindu Kush westward; and the Sulaiman southward. Locate these ranges.

The Himalayas ("Abode of Snow") separate India from Tibet. They contain forty peaks that rise more than 24,000 feet above the sea-level, one of which is the highest in the world. What is its name? How high is it?

The Kuen-lun Mountains separate Tibet from Chinese Turkestan and Mongolia. Though its crests are not so high as those of the Himalayas, this range surpasses them all in average altitude and is, on the whole, the most elevated on the earth. Between the Himalayas and the Kuen-luns is Tibet, the greatest plateau in the world; its average elevation is almost as high as the highest peak (Mount Blanc) in the Alps.

The Tian Shan ("Sky-Mountains") separate Turkestan from Chinese Turkestan, and are continued eastward as the Altai Mountains. Inclosed between the Kuen-luns on the south, the Altai on the north, and the Great Khingan Range on the east, lies the vast Gobi Plateau, (lower than the Tibet Plateau) the most of it a desert of sand and mountains. North-east of the Altai are the Yablonoi and beyond these the Stanovoi range extending to Bering Strait. These mountains are in detached masses and must not be considered a continuous range.

The continental axis of Asia extends from the Dardanelles to Bering Strait, and is believed to lie along the following mountain ranges: Taurus, Elburz, Hindu Kush, Pamir, Kuen-lun, Great Khingan, Yablonoi, and Stanovoi. At the Dardanelles it connects with the continental axis of Europe—making an almost continuous axis of 10,000 miles, extending from Cape Finisterre to Bering Strait; this is nearly as long as the continental axis of North and South America taken together. (Consult Relief Map, page 349, *The Story of the Earth and Its Peoples.*)

Asia presents many striking surface contrasts. It has, as we have learned, the greatest heights in the world; it has also the most deep-sunk depressions. It has the most elevated table-lands and the lowest plains. The deepest depression in the world is the valley of the Dead Sea, which is 1,312 feet below the sea-level.

The Arctic coasts of Asia are similar to those of North America and have had a similar origin. How were they formed? They are inhabited only by fur-bearing animals and sea-birds. The east, south, and west coasts of the continent are much broken by peninsulas, seas, gulfs, etc. The peninsulas are formed by mountain spurs or highlands extending oceanward. While these peninsular highlands were rising, corresponding depressions were forming beside them. Why should we expect this? These depressions have become seas, gulfs, etc. What is the relation of the capes of Asia to these peninsulas? Note that Arabia is the largest peninsula in the world.

What islands of Asia are continental in their origin? What evidence have we that the Japan Islands are formed by a range of mountains rising from the bed of the ocean? Why are earthquakes so frequent in Japan? Is it because the mountains are still growing? Why should this cause earthquakes? When we hear of earthquakes taking place in various parts of the world—some of them very destructive, others scarcely perceptible—is it a sign that the earth mass is still contracting in bulk? Why do you think so?

The plains of Asia are all on the outer borders of the continent? How would you account for this? All the great rivers of Asia have their source in the table-lands and mountains of the interior. Locate the chief plains and the rivers that flow through them. What rivers have

formed great alluvial plains that are supporting dense populations? So extensive are the alluvial plains formed by the rivers of India (Ganges, Brahmaputra, Indus), that it is said that one may travel from the mouth of the Ganges in a north-westerly direction to the Punjab without seeing a pebble as large as a small marble. The "stone-mills" in the mountains seem to be doing their work well. Explain. It is said that "Asia is the home of the twin-streams". Locate the Hwang-Ho and Yangtse-kiang, Ganges and Brahmaputra, Tigris and Euphrates, Sir and Amu. Locate the Mekong River. This river is 2,600 miles long and is said to have the largest volume of any river in Asia. How would you account for this? (Consult the Rainfall Map on page 40 of Text-book.)

AFRICA

Why is Africa called the "Dark Continent"? Give two reasons. Africa has no continental "backbone". What does this mean? It has no great mountain ranges in the interior. Africa is a great plateau continent. Why? It is walled in by a rim of mountains or highlands round the edge and parallel with the coast. Trace this rim on the map, noting the following mountains: Atlas, Kong, Kamerun, Drakenberg, and the Abyssinian Plateau culminating in the south in Mounts Kalimanjaro and Kenia. (Consult Relief Map on page 440, *The Story of the Earth and Its Peoples.*) On the map on page 237 of the Text-book, trace the drainage divide from the Mediterranean Sea to the Cape of Good Hope. From this divide trace the drainage divide to Cape Guardafui, inclosing the headwaters of the Nile. A great part of Africa requires no drainage. Why not? Note particularly the Sahara and Kalahari Deserts. Locate on the map the following river basins: Nile, Niger, Congo, Orange, Limpopo, Zambesi.

What natural obstructions to navigation are found on these rivers? Where are these obstructions situated? Why are they situated there? What effect have these obstructions upon the development of the interior of the continent? Why has the absence of good harbours on the coast a similar effect?

AUSTRALIA

This continent, like Africa, is a plateau surrounded by a rim of mountains and highlands with short slopes to the ocean. Its surface suggests a plate in form, since the low interior rises gradually to plateaus and mountains at the coast. The highest mountains are in the east and south-east near the coast. Tasmania is a continuation of the eastern highlands. What effect has each of the following factors upon the development of Australia:

1. The regularity of coast-line and the comparative absence of good harbours?
2. The proximity of the mountains to the coast?
3. The absence of navigable rivers leading into the interior?
4. Its isolation from the rest of the world?

Give a reason for your answer in each case. (See Relief Map, page 416, *The Story of the Earth and Its Peoples.*)

GENERAL REVIEW

After the pupils have mastered the preceding work on the continents, they should be ready to form a mental picture of the earth as a unit-body. Their minds, after a study of the parts comprising the whole, should now be prepared for a synthetic concept of the whole earth.

The questions that follow are intended merely as types. The teacher will, of course, supplement them to suit the

needs of the class. A good device to increase the interest and at the same time to secure the necessary review drill is to encourage competition among the pupils by having geography matches either written or oral. Try it.

What lands slope to the Pacific Ocean? To the Indian Ocean? To the Atlantic Ocean? To the Arctic Ocean? To the Mediterranean Sea? To what oceans do the short continental slopes incline? Nearest to what ocean is the continental axis of North America? Of South America? Of Eurasia? How many outlets has the Arctic Ocean? How wide is Bering Strait? What effect has this narrow outlet upon the climate of the North Pacific Ocean? Why? At what points do the Atlantic and Pacific Oceans join? What ocean is widest from east to west? What indentation extends farthest into the land?

What highlands protect the continents from being worn away by the waves and tides of the ocean? What coast-lines have no such protection? What islands seem to have once been parts of Europe? Of Asia? Of North America? From what highlands were they broken off? What islands partially inclose seas or large gulfs and bays in Asia? In Europe? In North America? What continental slope is most broken by large inlets? What peninsulas extend in a northerly direction?

What ocean receives most water from the land? What continental slope furnishes most water to the Pacific? What is the longest river in the world? The largest? Into what ocean do both these rivers flow? What is the longest river flowing into the Pacific Ocean? Into the Mediterranean Sea? Into the Indian Ocean? Into the Arctic Ocean? (Consult the Reference Tables in the Text-book.) What navigation difficulties are met with in the rivers flowing into the Arctic Ocean? In African

rivers? With the exception of the Darling River, why is there an absence of great rivers in Australia?

What area of North America is not drained into the ocean? (The Salt Lake Basin) Of Eurasia? Locate these on the map. How is the greater part of the interior of Australia drained? What regions in Africa do not require drainage? Why not? What is the largest river in the world whose waters do not reach the ocean? Note that this river depends less upon mountains for its waters than any other great river in the world. What becomes of the waters that flow into the Caspian and Dead Seas? Why do they not fill up and overflow their banks? Are they likely to have underground connection with the Mediterranean Sea? Why not? They occupy depressions that are below sea-level.

Name in order all the mountains over which the continental axes pass from Cape Finisterre to Cape Horn, via Bering Strait. What mountains form the primary, or main, highland region in North America? In South America? In Europe? In Asia? In Australia? What is the highest mountain peak in North America? In South America? In Europe? In Asia? In Africa? In what continents do the continental axes extend north and south? East and west? What relation has the direction of the continental axes to the general direction in which the continents extend? What are the two secondary highland regions of North America? The two secondary highlands of South America? What is the secondary highland region of Europe? In North America, South America, and Europe, locate definitely the broad plains between the primary and secondary highlands. What continents have broken coast-lines? Unbroken coast-lines? Which continents have been developed most? Which the least?

What relation is there between the character of the coast-line and the development of the continent? Explain.

INFLUENCE OF TOPOGRAPHY UPON CIVILIZATION

What effect has the structure of a country upon its civilization? A people can never become civilized unless they have *homes*. In ancient times permanent homes were possible only where fertile areas of the earth were walled in by natural barriers, such as mountains, deserts, etc.

In Palestine, for example, the land was fertile—a "land flowing with milk and honey". It was a country with many natural defences—bounded on the west by an almost inaccessible sea-coast; on the south by a great desert through which the wandering Israelites had passed; on the east by the Sea of Galilee, the deep valley of the River Jordan, and the Dead Sea. In the north was a plain, the one weak spot in this great natural fortress.

The Israelites had many enemies in the surrounding countries, many of them being wandering nomads whose trade was war. They were able to defend themselves successfully against these enemies for centuries and thus became the founders of the highest civilization of their time.

Other races in other regions had similar opportunities to develop a distinctive civilization. What natural conditions made possible the civilization of India, Japan, Egypt, Greece, Rome, respectively?

What modern forces and tendencies have made impossible the conditions upon which ancient civilizations were based? For some of the factors in the development of the British type of civilization see "The Evolution of the British Empire" (Chap. XV).

WORLD BARRIERS

For what purpose are jails, or prisons, used? Of what use are the barred doors and windows? The bars or "barriers" prevent prisoners getting outside or beyond them. Is the high jail wall a barrier too? Why?

How are lots, farms, etc., separated from one another? Are these "line" fences barriers? What purpose do they serve?

Are swamps, muskegs, rivers, lakes, etc., barriers? Why? Do animals, such as the horse, fox, dog, etc., find them barriers? Why? Do birds find them barriers? Why not? Does man? Why not? Are they barriers to the spread of trees, weeds, etc.? Explain. What name do we give to barriers found in nature, that is, not made by man? Name other "natural" barriers. Which of these may be called "world" barriers? Why?

MOUNTAIN BARRIERS

Name the greatest mountain ranges of the Old World. Which of these forms the greatest bar or barrier to travel? The Himalayas. Why?

Is man able to cross them? Are animals? Are birds? Are plants? Which of these would find the least difficulty in crossing the Himalayas? Why? What races of people are separated by the Himalayas? What general influence has this range of mountains had upon the development of the people of China and India? Why? What are some of the characteristic animals of India? Why are these animals not found to any great extent north of the Himalayas?

How are plants able to cross mountain ranges? What special difficulties do they meet with in crossing? Show that these difficulties are not met with in spreading over

a level country. Europe is a comparatively small continent. How would you account for its having so many races of people and languages? Name other mountain barriers and explain how man overcomes them.

OCEAN BARRIERS

Name the oceans. Are they barriers? Why? Why may we call them world barriers? Does man find the oceans as great barriers as formerly? Why not? What living things besides man, have found the oceans to be great barriers? What kind of oceans form the greatest barriers? (Wide oceans and the frozen oceans) Name the widest ocean. What continents are separated by it? What continents are separated by the frozen Arctic Ocean? Why is the Arctic Ocean so impassable a barrier? What ocean barriers separate America from the Old World?

What race of people lived in America at the time of its discovery by Columbus? Why were no white people found in America at that time? Were there any Indians living in Europe before Columbus discovered America? Why not?

What general effect did the ocean barriers of America have upon the development of its people during the long centuries before the white man came? In what respects are the Indians physically unlike the whites? (See Textbook.) After its discovery many white people settled in America. A large number of the descendants of the former are still to be found in various parts of the continent.

Did the early explorers of America find types of animals different from those found in the Old World? Name some of them. Why were these not found in the Old World? Name some important animals of Europe

not found in the New World. Why were they not found there?

Name some native American birds. Name a European bird that has become so common in America as to be a nuisance. Do birds find the ocean as great a barrier as the other lower animals? Why not? Did birds cross from Europe to America, and vice versa, before the latter was discovered? Name a few.

Do plants travel from one part of the earth to other parts? What proof have we of this? How do plants travel? Give an example. What effect has the ocean upon the dispersal of seeds? Why? Name plants found only in America previous to its discovery. Name plants, useful and injurious, which have since found their way to America.

NOTE.—The ocean barriers in relation to the other continents may be treated in a similar manner.

DESERT BARRIERS

Name the greatest desert in the world. What great race of people live south of the Sahara? North of the Sahara? What conditions for the independent development of these races were made possible by the Sahara desert?

Name typical wild animals found south of the Sahara. Why are these not found to any great extent north of the Sahara? Is the Sahara a total hindrance to the migration of birds? Why not?

Does it hinder the dispersal of seeds? Explain. How does man cross the Sahara? Name other desert barriers.

CHAPTER XIV

FORM IV, SENIOR GRADE

DETAILS OF THE COURSE

WINDS

1. Review lesson on "Winds" for Form II. (See page 64.)
2. Nature and influence of the following:
   - (1) Trade-winds
   - (2) Prevailing Westerlies
   - (3) Belts of calm:
     - (*a*) Equatorial (rising air),
     - (*b*) Horse latitudes (falling air).
   - (4) Monsoons
   - (5) Polar winds
   - (6) Summer and winter winds
   - (7) Cyclic winds of Eastern North America
   - (8) Sea breezes and mountain winds.

For hints on the teaching of a lesson on Winds, see "Suggestions for Lessons", Chapter XV. See also Geography Reader, "Monsoon Weather", page 49.

OCEAN CURRENTS

1. General cause and nature.
2. Influence of earth's rotation upon their direction.
3. The great ocean eddies.
4. They equalize temperature of ocean.
5. Principal currents—origin, course, influence:
   - (1) The Gulf Stream
   - (2) The Japan Current
   - (3) The Polar Currents
   - (4) Equatorial Currents.

Consult the Text-book, pages 43-5. Study The World map on page 44.

TIDES

1. Phenomena at the ocean side:
   (1) Rise and fall of water
   (2) Regular time-intervals
   (3) Effects upon shipping.
2. Explanation of phenomena:
   (1) The theory of attraction. (Illustrate by a magnet and a nail.)
   (2) Attraction of the Moon and Sun. (See diagrams, pages 45-6 of Text-book.)
   (3) Spring and neap tides. (Consult the Text-book, pages 45-6, and the *Ontario High School Physical Geography,* pages 232-3.)

ECLIPSES OF THE SUN AND MOON

1. Cause of eclipses. (Illustrate by means of candle and shadows.)
2. Eclipse of the moon—total, partial.
3. Eclipse of the sun—total, partial.
   Consult the Almanac for dates of eclipses.

CLIMATE

1. Distinction between weather and climate.
2. Factors that influence climate:
   (1) Latitude:
      (*a*) The effect of the sun's rays is greatest where they fall perpendicularly on the surface of the earth, and it diminishes as their obliquity increases.

(*b*) The surface covered by the oblique rays is greater than that covered by the perpendicular rays. (See diagram page 35, Text-book.)

(*c*) Oblique rays pass through a greater thickness of air and thus lose more heat by absorption. (Consult *Ontario High School Physical Geography,* diagram page 177.)

(*d*) The slope of the earth is important; a slope to the south is warmer than one to the north.

(2) Elevation:

The higher we ascend the colder it gets. The pupil must understand, in this connection, that the actual temperature of the air depends not so much upon the direct rays of the sun as upon the radiation from the heated surface of the earth.

(3) The nature of the soil:

(*a*) A sand or rock desert raises the temperature rapidly when heated by the sun's rays.

(*b*) A newly-ploughed field both absorbs and radiates heat much more rapidly than a grass field. Has the cultivation of the prairie tended to change its climate?

(4) Proximity to the sea:

(*a*) Water a poor absorber, and a poor radiator of heat

(*b*) Effect of great evaporation

(*c*) Effect of oceanic currents

(*d*) Maritime and continental climates.

(5) Rainfall:

(*a*) Coast countries have more rain than inland countries.

(*b*) Mountain regions are wetter than the plains.

(*c*) The tropics have more rainfall than other zones.

Explain and give illustrations. (Consult Rainfall Maps: Text-book, page 40; and *Ontario High School Physical Geography,* pages 168-71.)

(6) Prevailing winds:

Atmospheric currents exercise a greater influence upon climate than do ocean currents.

(7) Local circumstances:

(*a*) The amount of snowfall.

(*b*) Bogs and marshes cool the air and generate fogs.

(*c*) Clay soils retain moisture longer than lighter soils and have the same effect as marshes.

(*d*) The clearing, drainage, and cultivation of land generally have favourable effects on climate. On the other hand, a too complete removal of forests may prevent the deposition of moisture to such an extent as to cause droughts or even floods. Is this partially true of Old Ontario?

LIGHT ZONES

Torrid, North and South Frigid, North and South Temperate Zones; their boundaries.

For hints on teaching the Zones of Sunlight, see Chapter XV.

HEAT ZONES

1. Isotherms.
2. The Hot Belt, North and South Cold Caps, North and South Temperate Belts; their limits.
3. Plant and animal life:
   (1) Dependence of plant life upon soil, temperature, rainfall
   (2) Vegetation regions located. (See Text-book, page 49.)
   (3) Dependence of animal life upon vegetation
   (4) General distribution of animals. (See Text-book, page 55.)
4. The people of the world:
   The various races; their characteristics as influenced by environment; their distribution. (See Text-book, page 60.)

For hints on teaching the Zones of Heat, see Chapter XV.

NORTH AMERICA

A review of the subject-matter outlined for the Junior Grades of Forms III and IV.

SOUTH AMERICA

1. Review the subject-matter outlined for the Junior Grade of Form IV.
2. A general study of the continent as a whole:
   South America furnishes opportunity for the study of conditions prevailing in a tropical country. The wind and calm belts, together with the highlands, furnish a key for the interpretation of rainfall.

Study carefully, therefore, the prevailing winds and the relief of the continent as a whole. Account for the heavy rainfall in the equatorial region, in the Brazilian Highlands, and on the western slopes of the Andes in the temperate zone; also for the light rainfall on the western side of the Andes in the torrid zone; and for the wet and dry seasons north and south of the Equator. Show how these conditions influence the distribution and activities of man.

3. The Great Industries of the continent:

It is best to take the industries of the continent as a whole, rather than in connection with the study of the individual country. Since the surface, soil, climate, drainage, occupations, and productions of the whole continent have been carefully studied, the pupil will know in what division and climate-belt each country lies, and what, therefore, are the chief occupations of the people in each. It accordingly seems unnecessary to make a detailed topical study of each country. Let the study of these countries come incidentally in connection with the study of the continent as a whole, and emphasize in connection with each country such matters as are especially associated with it.

Teach thoroughly those industries and products which are typical of South America: coffee, cocoa, quinine, diamonds, nitrates, rubber. Picture, if possible, methods employed in production. Define areas.

Compare stock-raising with that industry as carried on in Canada. What areas? Why? Emphasize uses of the productions, their importance in the commercial world, the countries to which they are sent, the shipping ports, and routes.

In a similar manner study the wheat industry; show influence of imported machinery.

Why does South America send more of her products to Europe than to North America? What does she send to Canada? What do we send to her? Why are her manufactures not more fully developed?

Compare the forests with those of North America, and study their products.

Study briefly the most important mineral products.

Study somewhat carefully the construction and probable influence of the Panama Canal.

EUROPE

1. Review the subject-matter as outlined for the Junior Grade of Form IV. (See page 158.)
2. A further study of the continent as a whole, with special reference to rainfall, vegetation, agriculture and associated industries; mining; manufacturing; transportation, seaports; population; government.

ASIA

1. Review continent structure, coast-line, and drainage, as outlined for the Junior Grade of Form IV (See page 159.)
2. Complete the study by using outlines similar to those suggested for North and South America and Europe.

AFRICA

1. Situation:

   In regard to hemisphere, heat belts, wind belts, other continents, oceans, latitude, longitude.

2. Size:
   In comparison with other continents.
3. Coast-line:
   Extent, regularity, advantages and disadvantages, comparison with other continents.
4. Surface:
   Highlands, lowlands, their distribution, their characteristics, comparison with other continents.
5. Drainage:
   (1) Rivers: Nile, Congo, Niger, Senegal, Zambezi, Limpopo, and Orange—their general direction, characteristics, value from stand-point of commerce and exploration.
   (2) Lakes: Chad—location and relation to drainage. Lakes of Central Africa—reasons for size, importance.
6. Climate:
   (1) Temperature
   (2) Winds: prevailing winds, monsoons
   (3) Rainfall:
      General conditions arrived at from a knowledge of temperature, winds, surface. Specific conditions from study of rainfall map. (See page 40, Text-book.) Regions of extremely light and heavy rainfall accounted for.
   (4) Effect of climate upon exploration and development.
7. Vegetation:
   (1) General distribution as dependent upon temperature, soil, and rainfall
   (2) Character.
8. Animals:
   (1) Distribution as dependent upon vegetation
   (2) Character.

9. People:
   (1) Distribution as influenced by climate, vegetation, etc.
   (2) Races, characteristics.

AUSTRALIA AND NEW ZEALAND

Treat Australia and New Zealand from a causal standpoint. Fix upon some important problem early in the study, such as distribution of population, kinds of products and their distribution, to be worked out as the study proceeds. Apply the principles outlined for the study of South America (pages 174-5).

Suggestive topics:

Physical features; wind belts; distribution of temperature and rainfall; vegetation zones, population; products, transportation routes.

Special topics:

Mining; farming, ranching; exports, government, history, and relation to the Empire.

CANADA

A detailed review of the Dominion as a whole.

UNITED STATES

1. Position and size.
2. Division of States into sections. The subject-matter of each section to be treated as outlined in the Textbook:
   (1) New England States (6),
   (2) Middle Atlantic States (6), exclusive of District of Columbia,
   (3) Southern Atlantic States (4),

(4) Southern States of the Mississippi Basin (7),
(5) Northern States of the Mississippi Basin (14),
(6) Plateau States (8),
(7) Pacific Coast States (3).

3. Dependencies of the United States:
   (*a*) Alaska,
   (*b*) Hawaii,
   (*c*) Philippine Islands,
   (*d*) Porto Rico.

There are forty-eight States, New Mexico and Arizona being the last to reach this status. How many "stars" are there on the American flag?

THE BRITISH EMPIRE

The subject-matter in the Text-book (pages 250-258) may be made the basis of study. Use, if possible, a map of the British Empire similar to that on page 251 of the Text-book.

Discuss with the class:

1. The growth and extent of the Empire,
2. Its trade and commerce,
3. Communication within the Empire—trade routes, cable connections,
4. Protection of commerce.
5. Constituent parts:
   (*a*) in Europe, (*b*) in Asia, (*c*) in Africa, (*d*) in America, (*e*) in Australia and the Pacific Ocean.

For hints on teaching The Evolution of the British Empire, see Chapter XV.

CHAPTER XV

FORM IV, SENIOR GRADE

SUGGESTIONS FOR LESSONS

WINDS

THERE are great rivers of water in the ocean called ocean currents, such as the Equatorial Current, Gulf Stream, and Japan Current, that are continuously moving in fairly definite courses. So, too, in the atmosphere, there are great rivers of air called wind currents or winds that also move in more or less definite courses.

The air is very unstable and is therefore easily moved by outside forces. The principal forces that influence its movements are heat, moisture, and the rotation of the earth. Heat, as was pointed out in Form II, causes air to expand and thus makes it lighter in weight; moisture also makes it lighter; the rotation of the earth influences its direction.

The lighter air rises as the cooler and heavier air at the sides flows under it and lifts it up. When the air becomes lighter than usual, its pressure is said to be "low". Hence *high pressure* means a heavy atmosphere; and *low pressure,* a light atmosphere. These conditions are indicated and measured by the barometer. A fall in the barometer usually precedes a rainstorm. Why? Heated regions are always areas of low pressure; and cold regions, unless counteracting agencies are at work, are areas of high pressure. Winds always blow from areas of high pressure to areas of low pressure.

In areas of low pressure, where warm air is rising to form upper currents, or in areas of high pressure, where cool air is falling to form surface currents, areas of calms are formed. Hence, air currents moving along the surface of the earth produce winds, while those moving either upward or downward produce calms.

What is the greatest area of low pressure in the world? Why is it situated in the equatorial region? What name is given to it? This *Doldrum* region is one of great calms. Why? (See Text-book, page 38.) Where does this region get its supply of air? It is continuously rushing in as great surface currents from the north and from the south. What name is given to these winds? These *trade-winds,* as they are called, begin to blow at about the 30th parallel of latitude. In the northern hemisphere they blow from the north-east, and in the southern hemisphere from the south-east. Why?

The trade-winds are usually fresh and strong, and sailing vessels may go on for days without changing sail. These are the winds that carried Columbus with his three small ships across the Atlantic Ocean on his voyage to America in 1492. They are dry winds when they begin to blow, but when they reach the doldrum region they are almost saturated with moisture. How would you explain this? (See Text-book, page 37.) As the trade-winds travel toward the doldrums, they are gradually becoming warmer and warmer, and will therefore absorb more and more moisture. This makes them *drying* winds. What is the effect of these winds upon the lands over which they blow? What causes the Desert of Sahara?

What becomes of this flow of warm, moist air when it reaches the doldrums? Describe the climate of the doldrums. (See Text-book, page 38.) What becomes of the

air that rises in the doldrums? Have we any evidence that, after it rises to a great height, it flows off toward the poles? From observations made in the region of the West Indies and in the Caribbean Sea, as well as elsewhere where the trade-winds are blowing toward the south-west, one may see clouds at a great altitude being carried in the opposite direction. Locate on a globe or map the trade-wind regions with the doldrum region lying between. (See *Ontario High School Physical Geography,* page 201.)

What becomes of the upper air currents that flow from the doldrums off toward the poles? A large portion falls to the surface at about the 30th parallel of latitude. Here we find in both the northern and southern hemispheres, a region of calms and light winds. This is the area of highest pressure in the world. Why are calms so prevalent here? By what name is this region known? What becomes of the air that is falling in these **Horse Latitudes?* It is the source of supply for the trade-wind systems as well as for two other great wind systems known as the *Prevailing Westerlies.*

Why are the Prevailing Westerlies so called? When they leave the horse latitudes, they take a long sweep toward the east-northeast in the northern hemisphere, and toward the east-southeast in the southern hemisphere; in both cases they finally reach the polar regions. Why are these winds more uniform in the southern hemisphere than in the northern? Explain why it is easier for ships sailing from England to Australia to go by way of the Cape of

**It is said that the Horse Latitudes were so named because sailing vessels, carrying horses from New England to the West Indies in the early days, were so delayed by the calms that at times the horses had to be thrown overboard when the drinking water gave out.*

Good Hope than by way of Cape Horn. Which is the better route for the return voyage? Why?

The prevailing westerlies that blow over Canada and the Atlantic Ocean are somewhat variable; they blow on an average about two days out of every three throughout the year. For example, the average time of a *sailing* voyage from Liverpool to New York is thirty-three days; and from New York to Liverpool, twenty-two days. How do these prevailing westerly winds greatly affect the climate of British Columbia? Of the British Isles? Locate, on a globe or a map of the world, the regions over which these winds blow.

The Monsoon Winds of Southern Asia and the Indian Ocean are modified trade-winds—trade-winds that change with the season. From October to April they resemble the ordinary north-east trades, blowing from Asia over the Indian Ocean. Europeans in India find these months the pleasantest and most healthful part of the year. From April to October, however, the plateaus of Southern and Central Asia become so greatly heated that they become areas of low pressure—lower pressure than that over the Indian Ocean. The result is that the winds, instead of blowing from the north-east, turn completely around and blow strongly and steadily from the south-west. They bring excessive rains, and the weather becomes so hot and the humidity so great that many Europeans in India are forced to go to the foot-hills of the Himalayas for comfort and health.

The above is a general description only of the more constant winds. Owing, however, to the instability of the atmosphere, to frequent changes in heat conditions, as well as to various other causes, there are endless modifications in the character of winds. Some of the more important

of the variable winds are the polar winds, land and sea breezes, day breezes and night calms, thunder-storms, the common cyclonic or cycle storms of the Eastern United States and Eastern Canada, and the destructive tornadoes. Excellent supplementary material may be found in Chapter XI of the *Ontario High School Physical Geography.* Study the diagrams on page 38 of the Text-book until the location and direction of the principal winds are understood.

ZONES OF SUNLIGHT

What parts of the earth's surface receive most heat from the sun? Those parts upon which the sun's rays fall vertically. Where is the location of the farthest north point upon which the sun's rays are vertical? It is on the Tropic of Cancer. What is the latitude of the Tropic of Cancer? $23\frac{1}{2}^\circ$ north. Similarly show that the farthest south point upon which the sun's rays are vertical is the Tropic of Capricorn, $23\frac{1}{2}^\circ$ south. Hence, the only portion of the earth's surface that receives the direct or vertical rays of the sun some time during the year is located between the two tropics. This region extends like a belt around the earth and is called the *Torrid Zone.* It receives more light and heat than any other region on the earth. How many degrees in width is this zone?

How much of the earth's surface will receive rays of sunlight at any one moment? One half of its surface. Hence, when the sun is shining vertically down upon any one point, how far on all sides of this point will the earth receive rays of sunlight? Ninety degrees. Illustrate this by means of a candle and globe.

Hence, when the sun is shining vertically down upon the Tropic of Cancer, note that its rays will fall $23\frac{1}{2}$ degrees beyond the North Pole, that this determines the

latitude of the Arctic Circle, that the whole region within the Arctic Circle is in sunlight, and that the rays of the sun are very slanting since the sun is so near the horizon. Note, also, that at the same time the rays of the sun fall short of the South Pole $23\frac{1}{2}$ degrees, that this determines the latitude of the Antarctic Circle and that the whole region within the Antarctic Circle is without any sunlight whatever. Six months later these conditions are reversed. It is because these polar regions receive so little light and heat from the slanting sun's rays that they are called respectively, the *North Frigid Zone* and the *South Frigid Zone.* (See diagrams, page 15, Text-book.)

Between the Tropic of Cancer and the Arctic Circle in the northern hemisphere, and between the Tropic of Capricorn and the Antarctic Circle in the southern hemisphere are regions that are not so extremely hot as the Torrid Zone and not so extremely cold as the Frigid Zones. They are regions of moderate temperatures, and hence are known, respectively, as the *North Temperate Zone* and the *South Temperate Zone.* Unlike the Frigid Zones, the sun shines upon them every day of the year; its rays do not fall so slantingly upon them and hence are warmer. Unlike the Torrid Zone, no vertical rays of the sun ever fall upon them and therefore they are not so hot. How wide are the Temperate Zones? Each is $90—(23\frac{1}{2}+23\frac{1}{2})$ or 43 degrees wide.

In which Zone is Canada? What other countries are in the North Temperate Zone? What countries are in the South Temperate Zone? In the Torrid Zone? Draw a circle; indicate the two polar circles and the two tropics; write in the names of the five zones of sunlight.

ZONES OF HEAT

What instrument is used to measure the temperature of the air? How does the temperature vary during the day? It is usually warmer in the daytime than it is at night. What is the reason of this? By using special kinds of thermometers we are able to learn the highest and lowest temperatures for each day. If the highest temperature recorded on a certain day is 86 degrees and the lowest 52 degrees, what was the average temperature for that day? It was 69 degrees. How is the average yearly temperature of any place calculated?

What name is given to an imaginary line drawn around the earth connecting the places that have the same average yearly temperature? It is called an *isothermal line,* or *isotherm.* Do these isotherms form circles around the earth like the parallels of latitude? Why not? It is because the earth is not evenly heated.

Which warms faster, the land or the ocean? Why does the ocean not become as warm as the land under equal heat conditions? It is because the ocean has currents to carry the warmer water away to cooler places. It is because of this that the ocean has a more equable climate than the land. Why does an isotherm reach a higher latitude when it is crossing a continent than when it is crossing an ocean? (See *Ontario High School Physical Geography,* pages 184-187.)

What name is given to the isotherm passing through those places that have the greatest average temperature in the world? It is called the *Heat Equator.* Why is this heat equator not a circle like the geographical equator? Why does the heat equator change its position during the year? Why is its average position during the year always north of the geographical equator? It is because the

northern hemisphere has more land than the southern hemisphere that it is warmer than the latter.

Extending around the earth on both sides of the heat equator is a broad region known as the *Hot Belt.* Its northern boundary is the northern isotherm that has an average yearly temperature of 68 degrees. Its southern boundary is the southern isotherm of 68 degrees.

Around the north pole is an extremely cold area called the *North Cold Cap* in which the average temperature is never above 50 degrees. It takes at least 50 degrees to ripen the hardiest grains. What isotherm will therefore form the southern boundary of the north cold cap? Deal similarly with the *South Cold Cap.*

Between the hot belt on the south and the north cold cap is a region known as the *North Temperate Belt.* What is its northern boundary? Its southern boundary? What range of temperature has this belt? Its average temperatures range between 50 degrees and 68 degrees. Deal similarly with the *South Temperate Belt.* Why is the north temperate belt much wider than the south temperate belt? It is because the former has a greater land area than the latter. Explain.

Consult the map and note that the north temperate belt embraces the most progressive countries in the world, including Canada, the United States, all the countries of Europe, and China and Japan.

Draw a map of the world on Mercator's projection and show the general location of these heat belts, distinguishing them by different colour shadings.

SUGGESTIONS FOR A SERIES OF "TALKS" ON THE EVOLUTION OF THE BRITISH EMPIRE

To obtain a proper perspective of the British Empire as at present constituted, some of the geographical and historical factors that have been co-operating in its development should be considered.

1. In all ages and among all changes of inhabitants the insular character of Britain has been one of the ruling factors of its history. Its people, of whatever race or speech, whatever their political condition at home or their political relation to other countries, have been above all things pre-eminently islanders—cut off in many ways from the rest of the world, acting in many things as a separate world.

2. There settled early in England roving, adventurous, liberty-loving Anglo-Saxons, and their roving, adventurous spirit has been transmitted to the succeeding generations of the British people. These were not content to stay within the limits of their little home islands, and many went forth, especially during the sixteenth, seventeenth, and eighteenth centuries, as sailors, explorers, and colonizers. As they discovered new regions, they took formal possession of them in the name of their Mother-country. In this way, and by war, Britain came into possession of Canada, India, Australia, New Zealand, and South Africa, as well as the smaller colonies scattered over the world.

3. Thus, from small beginnings the British Empire has grown until to-day it stands first among the nations in wealth, power, area, and population. It occupies over one fifth of the land surface and includes more than a quarter of the total population of the world. In this population are represented practically all the races and gradations of human society correlated within the jurisdiction

of one paramount state. The position of the British Islands at the centre of the land hemisphere helps greatly to explain the enormous extent of British commerce.

4. The Saxon brought with him to Britain the democratic spirit in government and democratic form of government—popular representation of the governed. "A germ of political and social life was brought into Britain which, changing from generation to generation but never itself exchanged for any other system, borrowing from foreign sources but assimilating what it borrowed with its own essence, changing its outward shape but abiding untouched in its true substance, has lived and grown through fourteen hundred years into the law, the constitution, the social being of England."—FREEMAN. Since the war of American Independence, Great Britain has governed her colonies in such a way as to advance their interests, and not merely for her own advantage. Autonomy has been granted as soon as they have been able to assume responsibility. A spirit of toleration for language and religion, a belief in the supremacy of law and in personal and political freedom, a recognition of mutual rights and privileges have marked the administration of Great Britain in every quarter of the globe.

The sea which sheltered England from the armies which devastated much of Europe had accustomed the Britons to the handling of ships. Henry VIII created the English navy and improved it year by year. Elizabeth claimed the freedom of the seas in 1580; and in 1588, by the destruction of the Armada she broke the monopoly of the seas then claimed by Spain. The struggle later for the empire of the sea lay between France and England and ended at Trafalgar. Since then Britain has maintained that supremacy at sea which is the condition of her existence.

The unity of the Empire depends for its strength upon a common ancestry, common ideals, a community of interests, and a loyalty bred from the traditions and history of a glorious past. The supremacy of the Empire is a guarantee of peace and justice throughout the world. Our task and aim should be to fit ourselves, by closer union, to maintain its limits and extend its influence.

CANADA'S RELATIONSHIP TO THE EMPIRE

In considering Canada's relation to Britain and the rest of the Empire, the following points, among others, should receive attention:

1. How Canada became a part of the British Empire.

2. How the favourable terms granted to the French-Canadians by the Treaty of Paris (1763), and their contentment under British rule, have made them loyal to Britain and to British institutions.

3. How a strong stimulus was given to loyalty to British connection by the settlement in Canada of thousands of United Empire Loyalists at the close of the American War of Independence.

4. How this loyalty was greatly intensified by the War of 1812-15.

5. How the principle of self-government, gradually conceded by Great Britain, tended to make Canadians contented with British connection.

6. How the Boer and the German Wars tended to strengthen Imperial patriotism and Canadian national self-respect.

7. Canada's present status may be summed up as follows:

(1) The British Government appoints the Governor-general; and may veto, within two years after passing, any Act of the Canadian Parliament which it may regard as detrimental to the interests of the Empire. It would be only under the most grave circumstances that we can conceive of this power being exercised.

(2) Canada has fiscal independence, but gives a "preferential tariff" to the Mother-country and to most of the other parts of the Empire, except Australia.

(3) Canada has assumed, with the concurrence of the British Government, the full responsibility of maintaining a permanent military force, militia, and navy for her own defence, and in so doing is relieving the Mother-country of a part of her heavy Imperial responsibilities.

(4) Canada has not yet any voice in the declaration of war or peace; the Imperial Government alone has this power.

(5) The highest court of appeal is the Judicial Committee of the Imperial Privy Council.

(6) The strongest tie binding Canada to the rest of the Empire is the one of sentiment, based chiefly upon community of interest and of blood relationship.

(7) In other respects Canada is virtually an independent country with full control of her affairs.

Daughter am I in my mother's house,
But mistress in my own.—KIPLING

BOOKS OF REFERENCE

METHODS OF TEACHING

The Teaching of Geography in Elementary Schools. Dodge & Kirchwey. Rand, McNally & Co., Chicago.

The Teaching of Geography. Geikie. Macmillan, Toronto.

Special Method in Geography. McMurry. Macmillan, Toronto.

The New Basis of Geography. Redway. Macmillan, Toronto.

The Teaching of Geography. Sutherland. Scott, Foresman & Co., Chicago.

A Rational Geography, Pts. I, II, III. Young. George Philip & Son, London, Eng.

SUPPLEMENTARY BOOKS FOR TEACHERS

Commercial and Industrial Geography. Keller and Bishop. Ginn & Co., Boston.

Influence of Geography Upon Environment. Semple. Henry Holt & Co., New York.

Home Geography for Primary Grades. Fairbanks. Educational Publishing Co., New York.

Commercial Raw Products. Toothaker. Ginn & Co., Boston.

How the World is Fed. Carpenter. American Book Co., New York.

How the World is Housed. Carpenter. American Book Co., New York.

How We Are Sheltered. Chamberlain. Macmillan, Toronto.

How We Are Clothed. Chamberlain. Macmillan, Toronto

How We Are Fed. Chamberlain. Macmillan, Toronto.

How We Travel. Chamberlain. Macmillan, Toronto.

Stories of Industry. Vols. I, II. Educational Publishing Co., New York.

Man and His Markets. Lyde. Macmillan, Toronto.

Great American Industries. Ed. Rocheleau. McClelland, Goodchild & Stewart, Toronto.

Minerals; Manufactures; Products of the Soil; Transportation.

Historical and Economic Geographies. Vols. I-VI. Dent, Toronto.

I. World Studies; II. Europe; III. Asia; IV. The Americas; V. Africa and Australia; VI. The British Isles and the British Empire.

Man and His Conquest of Nature. Newbegin. A. & C. Black, London, Eng.

Regional Geography—The World. Reynolds. A. & C. Black, London, Eng.

GEOGRAPHY READERS

(Consult *Catalogue of Books* recommended for Public and Separate School Libraries, page 96.)

A Geography Reader—Asia. Huntington. Rand, McNally & Co., Chicago.

Africa as Seen by its Explorers. E. J. Webb. Edward Arnold, London, Eng.

Highroads of Geography. Vols. I-V. T. Nelson & Sons, Toronto.

New Century Geography Readers. Vols. I-VII. Blackie & Son, London, Eng.

Carpenter's Geographical Readers. Vols. I-V. American Book Co., New York.

The Youth's Companion Series. Ginn & Co., Boston.

The Wide World; Under Sunny Skies; Toward the Rising Sun; Industries of To-day.

The World and Its People. T. Nelson & Sons, Toronto.

Europe; Asia; Africa; America; Australasia.

The Continents and Their People. Chamberlain. Macmillan, Toronto.

North America; South America; Asia; Europe; Africa.

Industrial Studies—Europe. Allen. Ginn & Co., Boston.

Home Life in All Lands. Morris. Lippincott & Son, Philadelphia.

How the World Lives; Manners and Customs of Uncivilized Peoples.

GENERAL READING FOR LIBRARY

Earth and Sky Every Child Should Know. Rogers. McClelland, Goodchild, & Stewart.

Water Wonders Every Child Should Know. Thompson. Doubleday, Page & Co.

Peeps at Many Lands and Cities. Macmillan (Black), Toronto.
France; Holland; Egypt; etc.

Peeps at Great Industries. Macmillan (Black), Toronto.
Rubber; Tea; Sugar; and others.

Little Folks of Many Lands. Chance. Ginn & Co., Boston.

Lucita—A Child's Story of Old Mexico. Gaines. Rand, McNally & Co., Chicago.

The Little Cousin Series. 30 vols. The Page Co., Boston.

Library of Travel Series. McClelland, Goodchild & Stewart, Toronto.
Little Journeys to China and Japan; Little Journeys to Mexico and Central America; Little Journeys to Russia and Austria; Little Journeys to Holland, Belgium, and Denmark; Little Journeys to Cuba and Porto Rico.

Little People Everywhere Series. 20 vols. Little, Brown & Co., Boston.

Big People and Little People of Other Lands. Shaw. American Book Co., New York.

Travels in the Far East. Peck. Crowell & Co., New York.

The New North. Cameron. Appleton & Co., New York.

Pathfinders of the West. Laut. Macmillan, Toronto.

Eskimo Stories. Smith. Rand, McNally & Co., Toronto.

Twentieth Century Geography Readers. Vols. I-VII. Chambers, W. & R., Edinburgh.

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Europe; Asia; Africa; America.